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ABSTRACT

The doctoral dissertation comprising this report involves a study done to describe the general characteristics (personal and work-related) of a national sample of 1,282 physician assistants (PA's) and to assess their job performance and job satisfaction. Chapter I discusses the project background and purpose, and reviews the literature in three areas: (1) General descriptive characteristics; (2) job performance; and (3) job satisfaction. Chapter II covers methodology and discusses the study sample and variables (personal, background, work environment and job characteristics; and job performance and satisfaction measurements); the research design involving the mailing of questionnaires to PA's and their supervising physician; job performance and satisfaction measurement strategies; and data analysis procedures, including path analysis, a multivariate strategy. Chapter III presents an extensive descriptive analysis of the aforementioned general characteristics of the study sample and some relationships between these variables. Chapter IV discusses the general levels of the study sample's job performance and satisfaction and the relationship between these and the general characteristics variables. Chapter V, in considerable detail, incorporates the study variables into causal models and assesses the resulting multivariate relationships by means of path analysis. Chapter VI presents an assessment of important policy implications suggested by the study results. The questionnaires sent to the PAs and supervising physicians, a comparison of the characterisitcs of two sample subgroups to their respective populations, and some supplementary data analysis tables are appended. (EM)

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PHYSICIAN ASSISTANTS: AN EMPIRICAL ANALYSIS OF THEIR GENERAL CHARACTERISTICS, JOB PERFORMANCE, AND JOB SATISFACTION

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16. Abstracts

This report describes the general characteristics, job performance, and job satisfaction of a nationwide sample of 939 physician assistants who graduated in 1974 or before. Physician assistants were found to be working predominantly in primary care specialties and in smaller communities. Favorable levels of role acceptance, income, and job opportunities were observed, but opportunities for career advancement were considered to be limited. Favorable levels of job performance and job satisfaction were also observed. The strongest correlates of both job performance and job satisfaction are the degree of physician supervisory support and amount of responsibility for patient care. A review of the physician assistant literature as well as the job performance literature is included.

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ABSTRACT

Although it is generally recognized that physician assistants constitute an important new health profession because of their potential ability to expand the availability of medical care, there is little available data concerning the physician assistant profession as a whole. The present project analyzes the general characteristics as well as the job performance and job satisfaction of 939 physician assistants who are representative of the profession as it existed in the fall of 1974.

Seventy-three percent of the study sample are working in primary care fields. Fifty-three percent are working in communities with populations of less than 50,000 persons. Physician assistants are more likely than physicians to be working in primary care fields and in smaller communities. Thus the physician assistant profession is reducing the specialty and geographic maldistribution of medical manpower in the United States.

Physician assistants report favorable levels of physician supervisory support and role acceptance by nurses and patients. Their mean income (expressed in 1974 dollars) is $14,285. Job opportunities appear to be plentiful, although career opportunities were considered to be rather limited. Almost

one-quarter of the sample have plans to enter medical school, and two-thirds have either already considered entering another occupational field or might do so in the future.

Bivariate and multivariate analyses indicate that MEDEX graduates are more likely than other civilian physician assistants to be working in primary care fields and in smaller communities. Graduates of "physician associate" programs, however, report a number of more favorable job characteristics, including level of responsibility, nurse acceptance, income, perceived occupational prestige, and job opportunities. Those working in smaller communities and in primary care fields possess a number of more favorable job characteristics as well.

Supervising physicians rate the job performance of their physician assistants quite highly. Self-evaluations of performance were poorly correlated with physician evaluations, however. Performance during physician assistant training appears to have only a weak effect upon job performance. The only variables consistently related to job performance measures were level of responsibility for patient care and physician role support. Although the causal influences between these variables and performance are probably reciprocal, our findings are at least consistent with the possibility that expanding one's responsibility and improving the role support provided by the supervising physician will improve job performance. Our multivariate analyses suggest that the job performance of military physician assistants is significantly greater than that of other study participants.

The job satisfaction of physician assistants is comparable to that reported for other professionals. The job turnover of physician assistants appears to be rather low, particularly in comparison to that for nurses. Both bivariate and multivariate analyses indicate that the major determinants of job satisfaction are level of physician role support, responsibility for patient care, and opportunities for career advancement. A number of other study variables were significantly but less strongly associated with job satisfaction.

Our findings suggest that with the continued growth of this new health profession, the undersupply of medical care services in primary care fields and in smaller communities is likely to be significantly improved. The career opportunities available to physician assistants should be expanded or persons with lower career aspirations should be recruited into the profession in order to prevent the departure of substantial numbers of physician assistants into other fields.

PREFACE

My interest in issues of health manpower has been greatly stimulated by several faculty members at Johns Hopkins who have generously shared their time and ideas with me. In particular, I am indebted to Archie Golden, Malcolm Peterson, Dory Storms, and David Levine for their inspiration, support, and encouragement. Others, such as Maureen McGuire, Laura Morlock, Al Mushlin, Dennis Carlson, Henry Seidel, and David Youngs provided important assistance at various stages of this project.

The M.D.-Ph.D. Program in the Behavioral Sciences has been a superb framework within which to pursue my interests in the interface between medicine and the behavioral sciences. Richard Rubin has been especially adept in helping me to organize my thoughts for this and other research projects with which I have been involved.

It has been a pleasure working with my thesis advisors, John Holland and Karl Alexander. Each has spent untold hours discussing various issues related to the thesis and reading earlier drafts. Dr. Holland introduced me to the vocational psychology literature and Dr. Alexander helped me through many complex problems in data analysis, particularly those associated with multivariate techniques. The education obtained from working with these outstanding professors has been, by far, the most valuable aspect of the dissertation experience.

This project could not have been undertaken without the cooperation of the Association of Physician Assistant Programs, which generously made available its roster of graduates. Suzanne Greenberg, Director of the Northeastern University Physician Assistant Program, and Donald Fisher, Executive Director of A.P.A.P., were especially helpful in arranging this cooperative venture. The Office of Manpower Studies, United States Department of Labor, provided financial support and were most understanding of unavoidable delays in the completion of this project.

Carol Licht, Joy Lail, and Joann Walzak provided valuable research and secretarial assistance. My wife Alice offered constant encouragement and enabled me to survive the many problems and discouragements which inevitably arise with projects of this magnitude and complexity.

Last, but not least, I would like to express my gratitude to the physician assistants and their supervising physicians who participated in this study. I am hopeful that the findings will serve to emphasize the increasingly important role played by these new health professionals in the provision of medical care in the United States.

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CHAPTER I

PRESENTATION OF THE PROJECT AND REVIEW OF THE LITERATURE

I. Introduction

One of the most significant developments in the health field during the past decade has been the creation of a new category of health professionals to assist in the provision of medical care. With appropriate training and supervision, physician assistants and nurse practitioners are able to take a patient's medical history, perform physical examinations, diagnose and treat common and uncomplicated medical problems, and assist with surgical or other therapeutic procedures.

Similar types of health professionals are functioning in other countries as well. The Russian feldsher, the Chinese barefoot doctor, and the medical auxiliary in many developing countries are performing important roles in delivery of medical services (Sidel, 1968 and 1972; Fendall, 1970). Although the development of this type of health professional in the United States has occurred more recently than in many other countries, it represents a continuation of the increasing division of labor in the health field which has taken place in the United States during this century. Whereas physicians previously constituted the principal occupational group in the health field, this is certainly no longer the case. Greenfield (1969, p. 29) notes that the percentage of those employed in the health field who are physicians has declined from 80% in 1900 to 16% in 1966. Physician assistants and nurse practitioners are the most recent of many allied health professional groups which have emerged to assist physicians in the provision of medical services.

Presently, there are approximately 50 physician assistant programs and 150 nurse practitioner programs (Charles Lewis, 1975). The graduates of these programs number approximately 2,900 and 3,600, respectively (Charles Lewis, 1975). Although these new health professions are still quite small, their size has increased markedly since 1970.

The major influences responsible for the creation of these two new health professions have been the escalation in the cost of medical care and the geographic and specialty maldistribution of health personnel (Cohen, 1974, p. 1). In the middle 1960's, health care costs began to rise at an unprecedented rate and the shortage of primary (i.e. ambulatory) medical care, particularly in inner city and rural areas, received widespread public attention. It was argued that physician assistants and nurse practitioners could contribute to the solution of these problems. In 1971, President Nixon pointed to this possibility in a special message to Congress in which he requested federal support for the training of these new health professionals:

> One of the most promising ways to expand the supply of medical care and to reduce its cost is through a greater use of allied health personnel, especially those who work as physicians' and dentists' assistants, nurse practitioners, and nurse midwives (Comptroller General, 1975, p. 2).

The goals in the legislation providing the requested support were to improve the "distribution, supply, quality, use, and efficiency of health personnel" (Comptroller General, 1975, p. 2). As a result of this federal funding, the number of programs training physician assistants and nurse practitioners increased from 12 in 1970 to 111 only three years later (Sadler, 1974).

In recognition of the potential importance of these new health professionals for the delivery of health services, there has been a substantial amount of research concerned with the roles of physician assistants and nurse practitioners. Almost without exception, however, these studies rely upon small, local samples. Consequently, our present knowledge of these new health professions is limited.

Relatively little is known about the types of persons who are entering these new professions, their work settings, or the exact nature of their jobs.

Furthermore, little attention has been given to the vocational adjustment of physician assistants and nurse practitioners, to their own evaluations of their new careers, or to the reactions of others with whom they work. All of these topics require additional investigation if we are to develop an adequate understanding of these important new health professions.

The purpose of this project, therefore, is to describe the general characteristics of a national sample of physician assistants and to assess their job performance and job satisfaction. Those general characteristics to be included in our analysis include the following personal and work-related variables:

(1) demographic characteristics
(2) academic and professional backgrounds
(3) type of work environment, as described by the specialty in which the physician assistant is employed, the type of practice setting, and the size of the community in which he works
(4) level of responsibility for patient care
(5) role acceptance
(6) levels of extrinsic rewards such as income, occupational prestige, job and career opportunities.

In addition to providing a comprehensive descriptive analysis of the physician assistant profession, this project will explore a number of issues in the vocational psychology literature concerned with job performance and job satisfaction. We will briefly summarize below our present understanding of the physician assistant profession as well as the influences upon job performance and job satisfaction for this and other occupational groups.

II. Literature Review

The literature review is divided into three parts. First, we will discuss the present evidence concerning the general characteristics of the physician assistant profession. The second and third sections will be concerned with job performance and job satisfaction respectively.

A. General Descriptive Characteristics of Physician Assistants

1. Personal and Background Characteristics

The first physician assistant program was established in 1965 at Duke University under the leadership of Dr. Eugene Stead, who conceived of physician assistants as being men "who might have been doctors if the turn of the wheel had given their families a social and financial structure to support the long general and special education needed to produce a doctor" (1967, p. 801). Men were preferred to women because the latter were not thought to possess either a suitable career orientation (Stead, 1966) or sufficient "temporal and geographic flexibility" (Estes, 1968, p. 1084). Nurses and other allied health professionals were not felt to be desirable candidates primarily because they were already in short supply and were considered to be "marginally employable people" (Stead, 1967, p. 800).

Because of this philosophy, the Duke physician assistant program sought to enroll former medical corpsmen. At that time, many corpsmen were being discharged by the military following duty in Viet Nam. Most of the programs which were established later adoped this same policy. Since the withdrawal of American military forces from Viet Nam, however, there has been a reduction in the percentage of former corpsmen among the trainees of at least several programs (Detmer et al, 1972; Nelson, Jacobs, and Nelson, 1974).

Because of its initial emphasis upon the recruitment of former corpsmen, the physician assistant profession is composed primarily of men. Scheffler and Stinson (1974) reported that only 20% of physician assistants in 1972 were women. More recent data from two programs (Nelson, Jacobs, Nelson, 1974; David Lewis, 1975) indicate that the sex distribution among their trainees has not changed. Thus, although the literature suggests a reduction in the recruitment of former corpsmen, the proportion of women entering the profession does not appear to have increased significantly.

Initially, prior college experience was given little emphasis in the selection of trainees. The Duke program, for instance, orginally required only a high school education and prior medical experience for admission (Stead, 1966). Most programs originally awarded certificates to their graduates, but more recently a number of programs have started awarding bachelor's degrees. Since physician assistant programs are generally two years in length, those awarding bachelor's degrees have had to change their admission requirements to include two prior years of college education. Consequently, there has been a substantial increase in the amount of prior education among trainees of at least one program (David Lewis, 1975). It is likely that similar changes have taken place in other programs as well.

The literature, then, provides some information concerning the demographic, educational, and vocational characteristics of the physician assistant profession and it also suggests that a number of these characteristics may have been undergoing significant shifts recently. Data which are representative of the profession are needed to substantiate these preliminary findings , however.

2. Work Environment Characteristics

One of the purposes of federal funding for physician assistant training is to improve the distribution of health manpower and to expand the availability of medical services. It is therefore important to determine if physician assistants are locating in areas of physician undersupply and working in primary care specialties (the field of medicine generally recognized as in greater need of additional manpower).

The Comptroller General's office (1975) obtained information regarding these issues from 299 physicians assistants during the summer of 1974: 65.2% were employed in counties which had fewer than the national average of physicians per capita and 78.7% were engaged in the provision of primary medical care. Data regarding the geographic and specialty distribution for the graduates of physician assistant programs known as MEDEX[1] have been reported as well (National Council of MEDEX Programs, 1974): 88% of their graduates as of January, 1974, were working in primary care fields and 56% were employed in communities with populations under 10,000 persons.[2] The Comptroller General's (1975) report compared MEDEX graduates with other physician assistants and found that the former were more likely to be located in primary care specialties and in geographic areas with fewer physicians per capita.

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[1] MEDEX programs generally provide more practical, on-the-job training than do other physician assistant programs. Most of this training is provided by a practicing physician who serves as a preceptor for the MEDEX trainee and then hires him following graduation (Smith et al, 1971).

The available evidence thus suggests that the specialty and geographic distributions of physician assistants is in part dependent upon the type of program attended. Nevertheless, for the profession as a whole, it appears that over three-fourths of physician assistants are working in primary care fields and approximately two-thirds are employed in counties with fewer than the national average of physicians per capita. Whether these data are representative of the profession is not known, however. Furthermore, the degree to which personal and background characteristics influence one's choice of specialty as well as geographic location has not yet been investigated. These topics will be considered in the present project.

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[2] We will see shortly (Table 11, Chapter 3) that the number of physicians per capita is substantially less in rural than in urban areas. Therefore, the size of the communities in which physician assistants work is a useful indirect indicator of the extent to which they are locating in areas of medical need.

3. Job Characteristics

The specific characteristics of the roles of physician assistants and their level of responsibility for patient care has also received only limited investigation. In some practice settings, physician assistants are involved primarily in obtaining relevant clinical information from patients to facilitate the supervising physician's diagnosis and treatment (Jacobs et al, 1974). In other settings, physician assistants manage minor, acute illnesses and consult physicians at their own discretion (Lairson, Record, and James, 1974; Levine et al, 1976). In still other practice settings, physician assistants serve as the health care provider for patients with chronic illnesses and receive close physician supervision (Komaroff et al, 1974). The role patterns which are most typical, however, are not known.

Scheffler and Stinson (1974) reported that physician assistants spent 32% of their average work day in the provision of patient care with a supervising physician present and an additional 37% in patient care without a physician present. They also reported that the degree of independent functioning increases as a physician assistant moved from his first job to his second. Little is known about the degree to which the physician assistants' personal and background characteristics or their work environments influence the roles they performed, however. For instance, does a new type of physician assistant called the physician associate[3] possess a different role from others in the physician assistant profession? This project will assess the influence of this as well as other personal, background, and work environment variables upon one's level of responsibility for patient care.

4. Role Acceptance

The level of role acceptance of physician assistants by physicians, nurses, and patients has been a matter of considerable interest, but unfortunately most acceptance studies pertain to relatively few physician assistants working usually in the same practice setting. Record and Greenlick (1975) observed high levels of acceptance by physicians supervising physician assistants employed at the Kaiser-Permanente Health Plan while much lower levels of acceptance were observed for nurses working in similar expanded roles. The authors attributed this difference in acceptance to different role orientations among supervising physicians. The supervisors of physician assistants were internists with subspecialty interests and their utilization of physician assistants allowed them to spend more time in their subspecialty areas, with less time devoted to the management of common and self-limited medical problems. The pediatric nurse practitioners and nurse-midwives employed by the plan, on the other hand, performed roles which were more closely allied to roles which the pediatricians and obstetricians viewed as their domain. Thus a greater amount of role conflict with supervising physicians resulted for the nurse practitioners and nurse-midwives than for the physician assistants. These findings suggest that specific characteristics of the practice settings and the specialties in which physician assistants are employed may influence the physician's role acceptance.

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[3] The term physician associate has been adopted by a number of programs to indicate the "nature of expertise" of their graduates, as one program brochure states, and their greater capability for independent responsibility for patient care.

While the reaction of the medical profession to the concept of the physician assistant has been generally favorable (Coye and Hansen, 1969; Borland, Williams, and Taylor, 1972; Todd, 1974), the reaction of the nursing profession has been mixed. Although the public pronouncements of nursing organizations and nursing leaders have been rather unsupportive of the development of the physician assistant profession (Rogers, 1972; Sadler, Sadler, and Bliss, 1972, pp. 190-211, Rothberg, 1973), the reactions of individual nurses who actually work with physician assistants appear to be generally favorable (Laws and Elliott, 1972; Lairson, Record, and James, 1974). One study, however, found that physician assistants themselves report role acceptance by nurses to be a common but not serious problem which usually occurred at the outset of the physician assistant's employment, "when the nurse did not know what to expect and feared that a newcomer would usurp a portion of her privileges and responsibilities" (Breer, Nelson, and Bosson, 1975, p. 302).

The literature, then, provides somewhat conflicting appraisals of the acceptance of physician assistants by nurses. Acceptance by patients does not appear to be a problem (Komaroff et al, 1974; Nelson, Jacobs, and Johnson, 1974), although little is known about factors which influence patient acceptance.

In summary, the available research concerning the role acceptance of physician assistants is limited to a few, small studies. We therefore cannot be sure that the findings are representative of the profession. Favorable levels of acceptance have been reported by physicians, nurses, and patients, but problems in acceptance by nurses have been encountered as well. In addition to describing the general levels of role acceptance for a national sample of physician assistants, this study will investigate how the personal and background characteristics of the study sample and their work environments influence role acceptance, a topic which has received little attention in earlier work.

5. Work-Related Rewards

The final group of general descriptive characteristics of the physician assistant profession of interest consists of work-related rewards such as income, occupational status, job opportunities, and career opportunities. Stead's (1966, 1967) original formulation of the physician assistant concept emphasized the necessity of establishing sufficient vocational rewards within the profession to attract capable people.

Salary and status are two important vocational rewards. The mean starting salaries of 151 physician assistants according to Scheffler and Stinson (1973) was $9,869 (expressed in 1972 dollars), which exceeded the average starting salary for hospital nurses at that time by approximately $1,600 (American Nurses' Association, 1974). Sadler, Sadler, and Bliss state that physician assistants

> resemble the physician in appearance (short white coat with stethoscope, opthalmoscope, etc.) and are quickly surpassing other supporting health professionals in direct patient care management and in financial reward. In responsibility and remuneration, they are coming to occupy the number two position on the health team (1972, pp. 33-4).

Thus the incomes and occupational status of physician assistants appear to exceed that of most nurses.[4]

The availability of jobs for physician assistants has not been examined directly, but Dobmeyer, Sonderegger, and Lowin (1975) found in a survey of physician assistant programs in 1972 that nearly all their students find jobs immediately or shortly after graduation. Thus, at least in 1972, the job market appeared to be favorable, although the situation may have changed since that time because of the marked increase in the number of recent graduates.

Little is known regarding the career opportunities for physician assistants, but there is some concern that such opportunities may be limited (Breytspraak and Pondy, 1969; Mahoney, 1973). One interview study (Breer, Nelson, and Bosson, 1975) has reported that some physician assistants perceive a lack of opportunity for advancement and, consequently, are attempting to gain admission to medical school. Another study (Engel and Schulman, 1975) found that only two-thirds of the graduates of two physician assistant programs indicated that they would be satisfied to remain in their present occupation for the remainder of their careers. The physician assistant profession has not been in existence long enough to know what future salaries and levels of responsibility for patient care can be expected by its members as they advance in their careers. Nevertheless, physician assistants' present views concerning their career opportunities deserve additional investigation. If limited career opportunities are perceived by those in the profession, problems of morale and movement into other fields are likely to become increasingly important in the future.

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[4] The lack of support of nursing leaders and organized nursing for the development of the physician assistant profession is probably due, at least in part, to their recognition of this trend.

This project will consider not only the actual levels of work-related rewards, but will also investigate their responsiveness to various personal, background, and work environment variables. Earlier findings, for instance, have indicated that male physician assistants and those located in non-metropolitan areas earn more than other physician assistants (Scheffler and Stinson, 1973).

Others (Sadler, Sadler, and Bliss, 1972, p. 28) have speculated that physician assistants will be able to earn more in subspecialty private practices than in primary care settings and have concluded that "the likely co-option of the . . . physician's assistant by subspecialty medicine is one of the most serious issues confronting the PA." We will examine the extent to which specialty, sex, and geographic location as well as other personal, background, and work environment characteristics influence not only income but also one's perception of his occupational prestige, job opportunities, and career opportunities.

B. Job Performance

1. Job Performance of Physician Assistants

Several studies have focused upon the professional performance of physician assistants. One of these (Komaroff et al, 1974) found that with appropriate supervision, physician assistants can manage patients with selected illnesses as adequately as physicians alone. Another study investigated the employing physicians' evaluations of the performance of graduates of one particular physician assistant program (Crovitz, Huse, and Lewis, 1973a). These authors concluded that "field ratings of P.A.'s were most favorable and reflected strong satisfaction with the P.A. graduates." The limited evidence, then, suggests that physician assistants can provide high quality medical care and that supervising physicians view it as such.

Although factors influencing the job performance of physician assistants have not been investigated, several studies have focused upon factors relating to performance during training. Nelson, Jacobs, and Nelson (1974) reported that older, married trainees performed more effectively. They also found intelligence, personality profiles, college background, and amount of prior medical experience to be unrelated to performance during training. Another study found that academic ability, as measured by the Scholastic Aptitude Test, was a significant predictor of success during training (Crovitz, Huse, and Lewis, 1973b), while other studies have suggested that certain personality characteristics may be important (Stone et al, 1973; Heikkinen, 1973).

The relevance of these variables for performance following graduation has not yet been investigated. Studies of physicians and nurses, however, indicate that performance during training and performance following graduation are by and large unrelated (Peterson et al, 1956; Taylor et al, 1964;

Richards et al, 1965; Saffer and Saffer, 1972; Wingard and Williamson, 1973).[5] There is, therefore, little basis for expecting that those variables related to physician assistant performance during training will also be related to job performance. The available evidence, then, provides little insight regarding what variables may be important for the job performance of physician assistants.

2. Job Performance in Other Occupations

In view of the uninformative state of the research literature concerning the important determinants of the job performance of physician assistants, findings from similar research concerned with other occupational groups may be drawn upon to suggest fruitful avenues for study. There are suggestions that interpersonal competence (Howell, 1966; Holland and Baird, 1968; Holland, 1973), employment in smaller work settings (Thomas, 1959; Revans, 1962), and greater supervisory support (Halpin and Winer, 1957; Halpin, 1957, Likert, 1961 and 1967) are associated with more favorable job performance. Consequently, we will assess the importance of these variables for the job performance of physician assistants.

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[5] There is, however, some evidence that performance during training is related to the job performance of recent medical school graduates. See Kegel-Flom (1975) and Peterson et al (1956) for evidence on this point.

Other findings from the vocational psychology literature are conflicting, not applicable to the physician assistant profession, or not readily incorporated into the present project.[6] Our investigation of the relationship of personal and work-related characteristics to the job performance of physician assistants will therefore be essentially exploratory since previous research provides only limited guidance concerning what we might expect to find for this group of new health professionals.

C. Job Satisfaction

1. Job Satisfaction of Physician Assistants

There have been only three studies of the job satisfaction of physician assistants. In one of these, Breytspraak and Pondy (1969) found the following factors to be associated with higher levels of job satisfaction: a special area of competence not possessed by co-workers, progressively increasing responsibility, and a promising future. In another study, Breer, Nelson, and Bosson (1975) reported that the physician assistants interviewed by them were "generally contented" with their roles, although many complained about long work hours and low salaries.

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[6] For a comprehensive and concise review of the job performance literature, see Vroom (1964, pp. 191-267).

A third study (En[illegible]els and Shulman, 1975) surveyed the graduates of two physician assistant programs. Fifty-one percent of the respondents indicated that they were "very satisfied" with their work, 38% were "satisfied", and 11% were "somewhat satisfied". Furthermore, a significant relationship was observed between level of responsibility and job satisfaction. Those respondents who felt they were not given an adequate amount of responsibility expressed less satisfaction with their work.

Although these studies have been limited to small samples, they suggest that the general level of job satisfaction of physician assistants is favorable. Differences in job satisfaction among physician assistants may depend upon level of responsibility for patient care, number of hours worked, income, and future career opportunities, among other things.

2. Job Satisfaction in Other Occupations

Although the job satisfaction of physician assistants has received little attention in the research concerned with this new occupation, this topic has been extensively investigated among other occupational groups.[7] Since this literature is voluminous, only those findings directly relevant to our project will be reviewed here.

The only personal characteristic consistently found to be associated with job satisfaction is age. Older workers are more satisfied with their jobs (Hoppock, 1935; Bernberg, 1954; Herzberg et al, Hulin and Smith, 1965; Turner and Lawrence, 1965; Crozier, 1971; Van Maanen and Katz, 1975). This finding is generally interpreted as implying that workers develop more realistic expectations for their work as they gain greater experience. Furthermore, a worker's extrinsic rewards from work generally increase as he grows older and receives salary raises and promotions.

The only characteristic of the work environment consistently related to job satisfaction is organizational size. Porter and Lawler (1965) conclude from their review of the pertinent literature that organizational size is inversely related to job satisfaction. Six of the seven studies reviewed by them reported this negative association. They hypothesized that lower group cohesiveness, higher task specialization, and less adequate interpersonal communication accounted for the lower levels of job satisfaction in larger organizations.

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[7] See Vroom (1964) and Crites (1969) for comprehensive reviews of this literature.

A number of job characteristics, on the other hand, have been demonstrated to be related to job satisfaction. Several studies have reported a positive association between level of responsibility and job satisfaction (Morse and Reimer, 1956; Ross and Zander, 1957; Ford, 1969).[8] Others have found a significant association between supportive supervisory behavior and the job satisfaction of subordinates (Fleishman, Harris, and Burtt, 1955; Halpin, 1957; Halpin and Winer, 1957; Seeman, 1957; Likert, 1961 and 1967). Workers who perceive their supervisors to be warm, trusting, and friendly report greater satisfaction with their work. Role acceptance among co-workers also appears to be important for job satisfaction (Van Zelst, 1951).

Additionally, the levels of extrinsic rewards derived from work have been associated with job satisfaction. Income (Centers and Cantril, 1946;

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[8] These findings pertain to white collar workers. Some conflicting results have been reported among blue collar workers, however (Turner and Lawrence 1965; Blood and Hulin 1967; Hulin and Blood, 1968).

Lawler and Porter, 1963; Kalleberg, 1974) occupational status (Hoppock, 1935; Centers, 1948; Porter, 1962; Kalleberg, 1974), and promotional opportunities (Sirota, 1959) have all been reported to be positively related to job satisfaction.

Finally, job performance and job satisfaction are themselves positively correlated at a low level. Vroom (1964, p. 183) reports a median correlation of .14 for twenty studies in which the relationship between performance and satisfaction has been assessed. The proper interpretation of this relationship has been the subject of considerable debate (Schwab and Cummings, 1970). Although some have considered satisfaction as having a causal influence upon performance (Parker and Kleemeir, 1951, p. 10; Strauss, 1968),the more plausible interpretation appears to be that performance has a causal influence upon satisfaction, particularly when "effective performance brings with it greater rewards, at not appreciably greater cost, than ineffective performance" (Vroom, 1964, p. 187). Others (Brayfield and Crockett, 1951; Porter and Lawler, 1968; Locke, 1970) have concurred in this interpretation.

In summary, the job satisfaction literature suggests a number of variables which are likely to be associated with the job satisfaction of physician assistants. We have included measures of these variables in this project. We have also reviewed the physician assistant and the job performance literature to assess our present state of knowledge regarding the general descriptive characteristics of the profession and particular variables which may be significant predictors of performance.

We will outline next the research design, measurement strategies, and analytic procedures employed in the present project. Following this review of methodology, we will consider our findings concerned with the general descriptive characteristics of the profession and the determinants of job performance and job satisfaction.

CHAPTER II

METHODOLOGY

I. Study Sample

In the fall of 1974, the Association of Physician Assistant Programs generously made available to the author a listing of 1282 physician assistants which comprised virtually all of the graduates at that time. Questionnaires were mailed to these persons in December, 1974, and 939 graduates of 32 physician assistant programs participated in the survey, representing a response rate of 73.2% after two followup requests to nonrespondents.

Of those who did respond, 84.1% (790/939) gave the author permission to survey their principal supervising physician. During the summer of 1975, a brief questionnaire was mailed to these 790 physicians, followed by a single additional request to non-respondents. A total of 662 physician questionnaires were received, yielding a response rate of 83.8%. Information from supervising physicians has therefore been obtained for 70.5% (662/939) of the study sample. The questionnaires sent to physician assistants and supervising physicians are reproduced in Appendices A and B respectively.

In Appendix C we have compared the characteristics of two sub-groups in our study sample with previously reported data for their respective populations. The characteristics of Medex respondents appear to be similar to those reported by the

National Council of MEDEX Programs (1974) for their graduates. Similarly, the graduates of the Duke Physician Associate Program included in our sample are almost identical to the total group of graduates of this program according to data reported by David Lewis (1975). Medex and Duke respondents compose 24.4% of the study sample. Thus these findings increase our confidence that the total study sample is representative of the entire population of physician assistants as of the fall, 1974. Further discussion of these comparisons is provided in Appendix C.

II. Study Variables

Five groups of variables have been included in the present study:

(1) personal and background characteristics of physician assistants
(2) work environment characteristics
(3) job characteristics
(4) job performance measures
(5) job satisfaction measures

A number of these variables have already been referred to in the literature review. In this section, we will list each variable and describe those whose measurement is not readily apparent. The location of each variable on the questionnaire is identified, and,unless otherwise specified, refers to the questionnaire completed by physician assistants shown in

Appendix A.

A. Personal and Background Characteristics

1. Age (question 75)

2. Sex (question 74)

3. Interpersonal competence (questions 34-39)

   This is a shortened version of the interpersonal competence scale developed by Holland and Baird (1968). Factor analysis of the original scale disclosed a principal factor containing the 6 items which have been included here (DeVries, 1974). This scale refers to a person's perceived ability for effective interpersonal interaction, including his ability to talk with "all kinds of people," and to assess the "motivation of other people."

4. Type and number of years of post-high school education (questions 76 and 77)

5. Type and number of years of medical experience before beginning physician assistant training (question 78).

   We have divided the study sample into three categories depending upon their type of prior medical experience: those who had been medical corpsmen, those who had some other type of prior medical experience, and those with no prior medical experience.

6. Physician assistant program attended and year of graduation (questions 68-69)

   Programs have been divided into 4 exclusive categories: associate, assistant, MEDEX, and military programs. Associate programs are those which have adopted the "associate" terminology for their program titles. The use of this term implies that their trainees receive more in-depth training which prepares them to function with greater expertise and responsibility following graduation. MEDEX programs are distinguished by their practical, on-the-job training by physician preceptors who generally hire their trainees following graduation. Assistant programs include those civilian programs which are neither associate nor MEDEX programs. Finally, military programs are those physician assistant programs which are sponsored by the military for their own personnel. The training provided by military programs is similar to that provided by associate and assistant programs.

7. Performance during physician assistant training (questions 68-69)

Performance in two different aspects of training has been assessed: basic science and classroom work, and patient care activities. Respondents were asked to indicate their class standing on each of these two dimensions. Because these two variables do not constitute a single scale, they have been treated separately in the analysis.

B. Work Environment Characteristics

1. Specialty of supervising physician (question 82)

Respondents have been assigned to one of four exclusive categories: (1) general primary care (family or general practice), (2) specialty primary care (general internal medicine, pediatrics, or obstetrics and gynecology), (3) surgery, or (4) other specialties. This classification scheme was considered to be the most logical one in view of the actual specialties reported by respondents.

2. Practice setting (question 83)

   Five different practice settings have been identified for respondents: (1) private solo practice, (2) private group practice, (3) clinic, (4) hospital, and (5) clinic plus hospital. Many of those working in private practice settings also function in hospitals as well. Since these persons are likely to work predominately in private practices, we have not included them in the "hospital" category. "Clinic" settings refer to both hospital outpatient clinics as well as satellite or neighborhood clinics. "Hospital" settings, on the other hand, refer only to emergency rooms or inpatient units.

3. Size of community in which respondent works (question 85)

4. Military versus civilian employment (obtained from page 22 of the questionnaire or from the original mailing list)

C. Job Characteristics

1. General role description (question 81)

   The respondents' descriptions of their responsibilities at work were classified into a number of categories, including primary care (the diagnosis and treatment of common medical problems of ambulatory patients), history taking and physical examinations, or assisting in surgery.

2. Time spent in various professional activities (question 87)

   The percentage of time at work devoted to various professional activities was requested. These types of activities include patient care (with and without a supervising physician acutally present), technical or laboratory work, clerical or secretarial work, and teaching other health professionals. This same question was used in Scheffler and Stinson's (1974) earlier survey of physician assistants.

3. Level of responsibility for patient care (question 31-33)

   This scale includes the respondent's assessment of the degree of influence he has in the care of patients and whether he is allowed to make decisions about particular aspects of patient care in which he has been appropriately trained.

4. Total number of hours worked per week and number of hours worked during evenings and weekends (questions 88-89)

5. Physician role support (questions 22-28 and 58)

   This scale describes the respondent's perception of the professional and personal support provided by supervising physicians. The items comprising this scale include the supervising physician's "interest in discussing problems in patient management", "help in improving clinical skills," "recognition for work well done," and his "acceptance of the physician assistant's role".

6. Nurse acceptance (question 59)

   Nurse acceptance has been assessed by asking the respondent to what extent he has encountered problems with nurses in "obtaining assistance when needed", in "developing warm working relationships", in following his instructions , or in role acceptance.

7. Patient acceptance (questions 54-55)

   Respondents were asked to estimate the percentage of patients they see who prefer to see a physician rather than themselves, and also the percentage who prefer to see them rather than a physician.

8. Income (question 52)

9. Perceived occupational prestige for physician assistants, nurses, physicians (question 51)

   The method developed by Siegal (1971) for measuring occupational prestige has been incorporated into this study. The response scores shown in question 51 have been transformed to range from 0 to 100 by subtracting 1 and then multiplying by 12.5.

10. Job opportunities (question 21)

    This item refers to the perceived ease with which the respondent could obtain another job.

11. Career opportunities (question 49)

    Respondents were asked to assess the availability of opportunities for career advancement in their present employment.

13. Career plans (questions 17 and 47)

    Information regarding plans for additional education was obtained from respondents. Also, respondents were asked to indicate the likelihood of their entering a different occupational field in the future.

D. Job Performance Measures

1. Self-rating of job performance (question 5-8)

The items constituting this scale pertain to the respondent's evaluation of his clinical knowledge, his ability to relate to patients, how often he considers himself to have done an outstanding job, and his perception of the confidence his supervising physician has in him.

2. Supervising physician's rating of job performance (questions 7-10 of the supervising physician questionnaire, Appendix B)

This scale contains the same items as the self-rating performance scale except for appropriate word changes.

3. Supervising physician's satisfaction with the physician assistant (questions 1-2 of the supervising physician questionnaire, Appendix B)

Supervising physicians were asked how satisfied they were in general with the work of their physician assistant and whether they would hire this particular person if they "had it to do over again."

E. Job Satisfaction Measures

1. Job satisfaction (questions 1-4)

This measure of job satisfaction was orginally developed by Hoppock (1935) and contains items assessing the following dimensions: (1) how much the respondent likes his job, (2) how much of the time he feels satisfied with his job, (3) his inclination to change jobs, and (4) his level of satisfaction compared to that of others.

2. Career satisfaction (questions 9-14)

   These items refer to satisfaction with one's career rather than with the job itself. They have been adapted from Gross, Mason, and McEachern's (1958) scale of career satisfaction for school superintendents. Respondents were asked if their career has lived up to the expectations they had beforehand, whether they would recommend their profession to a friend, and whether they would enter the same field if they "had it to do over again".

3. Expected length of employment (question 20)

   Respondents were asked to indicate how much longer they expected to continue in their present employment.

There are three common methods of assessing performance: objective measures, self-ratings, and supervisory ratings. An objective measure of the performance of physician assistants would require extensive personal observation or examination of medical records, procedures which are most suited for small-scale studies. The other types of measures of job performance, self-ratings and supervisory ratings, are more readily incorporated into a large scale study. Quite varied correlations between these two performance measures have been reported for other occupational groups (blue collar workers, scientists, and physicians): .42 to .77 (Pym and Auld, 1965), .39 (Strauss, 1966), and .17 to .31 (Kegel-Flom, 1971). Since neither of these rating methods is clearly superior to the other, and since they appear to be measuring somewhat different aspects of job performance, we have included both here.

With regard to the measurement of job satisfaction, the major issue concerns whether a unidimensional or a multidimensional measure is more appropriate. Strong arguments have been advanced for each (Hoppock, 1935; Vroom, 1964, pp. 101-105; Smith, Kendall, and Hulin, 1969), but unidimensional measures have more often been utilized in previous research. An important practical consideration is the economy of utilizing unidimensional, as compared with multidimensional, measures. One of the most highly regarded multidimensional measures contains 72 items (Smith, Kendall, and Hulin, 1969) while unidimensional measures typically include only several items. Given these considerations, we have chosen a unidimensional measure of job satisfaction originally developed by Hoppock (1935) which has been described by a prominent psychologist as the best unidimensional measure available (Crites, 1966). In addition, we have included two less direct measures of job satisfaction: career satisfaction and expected length of employment in one's present position.

All of the scales used in this study have been constructed by weighing each component item equally and by assigning the sample mean for items to which respondents failed to reply. None of the items composing a scale contain missing information from more than 5% of the study sample. Where necessary, individual items have been recoded to provide consistency inthe meaning of scores for those items composing a particular scale.

Scale reliabilities are shown in Table 1. All are .761 or greater except for interpersonal competence and self-rating of job performance. Although the reliability of these two scales is less than optimal, it was considered adequate for our purposes.[1] Additional scales were insufficently reliable to be included in the analysis. The separate items for one of these, performance during training, have been included, however.

In the discussion of results, we will occasionally refer to comments made by respondents. These have been taken either from the last page of the physician assistant questionnaire,where space was provided for respondents to make any final comments,or from the text of the questionnaire where additional explanations of responses were given.

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[1] Efforts to improve the reliability of these two scales by deleting particular items were unsuccessful.

Table 1

Scale Reliabilities

Scale	Reliability as Assessed by Coefficient Alpha[a]
Interpersonal Competence	.493
Level of Responsibility for Patient Care	.780
Physician Role Support	.829
Nurse Acceptance	.930
Self-Rating of Job Performance	.532
Supervising Physician's Rating of Job Performance	.761
Supervising Physician's Satisfaction With the Physician Assistant's Job Performance	.782
Job Satisfaction	.825
Career Satisfaction	.767

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[a] See Cronbach (1951) and Nunnally (1967, p. 196) for the computation and rationale of this statistic.

III. Data Analysis

In addition to simple frequency distributions for specific variables, bivariate and multivariate strategies will be employed. Bivariate relationships will be assessed by cross tabulation, analysis of variance or correlation, depending on the nature of the variables being compared.[2] Path analysis will be employed to evaluate multivariate relationships of interests. This procedure, described in detail by Duncan (1966, 1975), Heise (1969), and Land (1969), utilizes multiple regression techniques in evaluating simple, recursive causal models.

The use of path analysis requires the development of explicit assumptions regarding the causal ordering of variables. The results obtained from this technique, however, can neither confirm nor disconfirm the appropriateness of the causal model which has been employed in the analysis (Duncan, 1975, p. 27). Rather, its value is in precisely evaluating the implications of the assumptions which have been adopted for the particular social process under consideration. This is a particular advantage because issues of causality have been largely neglected in research concerning job performance and job satisfaction.

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[2] Discussions of these bivariate techniques and their associated tests of statistical significance can be found in Dixon and Massey (1969).

With path analysis, one can "decompose" relationships between prior and subsequent variables into direct and indirect effects, thereby gaining useful insights into the dynamics of causal processes. Although standard "tracing rules" have been developed for calculating these separate effects (Duncan, 1975, pp. 31-36), a much simpler procedure, described by Alwin and Hauser (1975), is particularly useful for causal models such as ours which include a large number of variables. Their procedure involves regressing a particular dependent variable upon a prior causal variable to obtain the total effect and then adding intervening variables in subsequent regressions to obtain the direct and mediated effects. Indirect effects are computed by subtracting direct effects, in sequence, from total effects.

The results obtained by path analysis are based upon correlations between the variables included in the analysis. Using the reliability estimates shown in Table 1 for each of the scaled variables, those correlations obtained for these variables have been corrected for attenuation according to the method described by Nunnally (1967, p. 204). These corrected correlations are what would be expected if each of the scaled variables possessed perfect reliability.

Nominal variables are incorporated into path analyses through the use of so called "dummy" variables (Suits, 1957). The four nominal variables in the path analyses for this project are: sex, program, specialty, and practice setting. The dummy variable describing the sex of respondents has been assigned a score of "1" for men and "0" for women. Three dummy variables are required to describe the type of physician assistant program attended. One, labeled PRGM 1, refers to graduates of associate programs. Graduates of such programs have been assigned a score of "1" for this dummy variable, while all other graduates have received a score of "0". PRGM 2 refers to graduates of MEDEX programs, and PRGM 3, to graduates of military programs. The other category of graduates, those attending an assistant program, has been "suppressed" since its effects are readily ascertainable from the pattern of effects exhibited by the other program dummy variables.[2]

Specialty and practice setting have been treated in a similar fashion. One dummy variable, labeled SPCLTY 1, refers to those in general primary care and a second, labeled SPCLTY 2, refers to those in specialty primary care. The remaining specialties (surgery and other specialties) constitute the suppressed specialty category. Finally, the practice setting variable has been reduced to two categories for the purposes of path analysis. The dummy variable PRACTICE has been assigned a score of "1" for those working in institutional settings (hospitals or clinics) and a score of "0" for those in private practices.

Only respondents with valid or estimable responses for all variables in a given multivariate analysis have been included in that analysis. This entails a considerable reduction in effective sample size because of the large number of variables included in the analysis and the relative independence of missing data among variables for a given case. In the analysis which includes self-rating performance scores, 697 cases contain complete information. For the analysis utilizing physician ratings, the number of such cases is reduced still further to 506. Thus the effective sample sizes have been reduced by 25.8% and 46.1% respectively.

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[2] If the effects of each of the three dummy program variables for a given dependent variable are all significant, positive, and of similar magnitude, this would be interpreted as a negative effect of attending an assistant program (relative to attending other types of programs) upon the dependent variable.

Although these are major reductions, the means and standard deviations for each variable included in the two path analysis samples deviate only slightly from those for the total study sample. Table 2 contains these findings. None of the variable means for either path analysis sample differ by more than a tenth of a standard deviation unit from the mean of the same variable in the total sample. These results suggest that despite the considerable reduction in effective sample size required for the multivariate analyses, these samples remain quite representative of the total study sample.

For both bivariate and multivariate analyses, the sample sizes are sufficiently large that levels of statistical significance (as conventionally determined) are frequently obtained for relationships which have little substantive significance. In order to limit our discussion to findings of

Table 2

Comparison Of Samples Used For Path Analysis With The Total Study Sample

	Total Study Sample			Sample for Path Analysis Without M.D. Ratings of Performance (N=697)		Sample for Path Analysis With M.D. Ratings of Performance (N=506)	
	Mean	S.D.	N	Mean	S.D.	Mean	S.D.
AGE	30.55	5.73	936	30.61	5.73	30.82	5.77
SEX	0.83	0.37	939	0.84	0.37	0.86	0.35
INTER COMP	10.04	1.37	939	10.08	1.31	10.09	1.33
NO YRS ED	2.58	1.79	932	2.57	1.73	2.62	1.73
NO YRS EXP	5.18	5.79	939	5.25	5.74	5.32	5.88
PRGM 1	0.31	0.47	928	0.30	0.46	0.31	0.46
PRGM 2	0.19	0.39	928	0.19	0.39	0.19	0.40
PRGM 3	0.11	0.31	928	0.12	0.32	0.12	0.33
ACAD PERF	3.29	0.63	931	3.29	0.63	3.28	0.64
PT PERF	3.46	0.54	932	3.48	0.54	3.50	0.53
YR GRAD	73.00	2.72	928	73.12	1.46	73.11	1.34
SPCLTY 1	0.44	0.50	902	0.44	0.50	0.46	0.50
SPCLTY 2	0.29	0.46	902	0.29	0.46	0.28	0.45
PRACTICE	0.50	0.50	870	0.50	0.50	0.49	0.50
SIZE COMM	2.56	1.32	918	2.52	1.29	2.43	1.27
LEV RESP	10.10	1.83	939	10.14	1.86	10.33	1.66
MD ROLE SUP	18.56	2.00	939	18.58	2.00	18.76	1.84
RN ACCEP	10.74	1.92	939	10.78	1.85	10.93	1.83
INCOME	14,235.00	4,240.00	911	14,165.27	3,824.29	14,329.70	3,679.54
PRESTIGE	60.70	18.24	868	60.62	17.50	61.34	17.63
JOB OPP	3.81	1.18	913	3.83	1.17	3.85	1.17
CAR OPP	2.61	1.09	928	2.61	1.09	2.65	1.11
JOB PERF (SELF-RATING)	15.61	2.26	939	15.62	2.29	15.77	2.21
JOB PERF (M.D. RATING)	16.22	2.97	654	16.31	2.98	16.30	2.98
JOB SAT	22.57	2.98	939	22.63	3.03	22.92	2.83

substantive significance, we will present only those which are statistically significant at the .001 level or less, a relatively stringent criterion.

The remaining chapters present the results of the data analyses. The next chapter reports the descriptive characteristics of the study sample. The following chapter assesses the correlates of job performance and job satisfaction. Finally, the results obtained with path analysis are described in the concluding analysis chapter.

CHAPTER III

DESCRIPTIVE ANALYSIS OF THE GENERAL CHARACTERISTICS OF THE PHYSICIAN ASSISTANT PROFESSION

Most of our knowledge about the physician assistant profession is based on studies of small numbers of these new professionals. Since the present study is the largest and most representative study of physician assistants to date, we intend to devote considerable attention to the descriptive characteristics of this new profession.

In particular, we are interested in the personal and background characteristics of physician assistants, their work environments, and their job characteristics. Such information will fill a void concerning our present knowledge of this new profession.

I. Personal and Background Characteristics

A. General Description

We begin our discussion of the descriptive characteristics of the physician assistant profession with an analysis of some basic demographic and background characteristics of study participants. We will consider shortly the temporal changes which have occurred in these characteristics among more recent graduates.

The average age of the physician assistants in our study is 30.6 years. As shown in Table 1A, almost half are between the ages of 25 and 30.

Table I

Demographic Characteristics of Physician Assistants

A. Age	Percent (N=936)
20-24	8.3%
25-29	45.9
30-34	27.1
35 and over	18.7
	100.0
mean age	30.6 years

B. Sex	Percent (N=935)
male	83.7%
female	16.3
	100.0

The finding that one-fifth of the sample is 35 years of age or older was unanticipated. As we will see later, this group is composed predominately of physician assistants employed by the military who have generally had substantially more prior medical experience than civilian physician assistants.

The sex distribution of the sample is shown in Table 1B. According to Scheffler and Stinson's (1974) earlier study, the profession is composed predominately of men. Our findings indicate that only 16.3% of physician assistants are women, slightly less than the 20% figure reported by Scheffler and Stinson.

As we pointed out earlier, Stead (1966, 1967) conceived of the physician assistant profession as being composed predominately of men because he felt they would have a greater commitment to a career as a physician assistant as well as a greater willingness to meet the demands required of them by their work. The available evidence indicates that women applicants to physician assistant programs are just as likely to gain admission as men (Nelson, Jacobs, and Nelson, 1974; Crovitz, 1975). Thus it would appear that the predominance of men in the profession is due to their greater representation among program applicants rather than discrimination against women applicants to physician assistant programs.

The educational backgrounds of respondents prior to beginning physician assistant training are shown in Table 2. Approximately two-thirds attended college, and two-thirds received some type of medical training. For the sample as a whole, the average amount of post-high school education obtained before beginning physician assistant training is 2.58 years. Approximately one-third of the respondents had obtained at least four years of post-high school education before entering a physician assistant program.

The average length of medical experience prior to physician assistant training is 5.18 years, and all but 22.4% of the respondents reported a previous medical occupation (see Table 3). Slightly over half had been corpsmen, and approximately one-fifth had been medical technologists or technicians. Other medical occupations, including nursing, were mentioned by only a small percentage of the respondents.

The "typical" physician assistant, then, has at least several years of college-level education or training and rather extensive experience in another

Table 2

Post-High School Education Prior to Beginning Physician Assistant Training

A. Academic Education	Percent (N=939)
none	22.0%
community college	12.5
college	65.5
	100.0

B. Medical Training	Percent (N=939)
no	31.1%
yes	68.9
	100.0

C. Total Number of Years of Post-High School Education and Training	Percent (N=932)
less than 1 year	15.3%
1 year	13.4
2 years	24.0
3 years	15.2
4 years	18.3
more than 4 years	13.8
	100.0
mean	2.58 years

Table 3

Occupational Background and Number of Years of Medical Experience Prior to Beginning Physician Assistant Training

	Percent[a] (N=939)	Average Number Years Experience
Medical Corpsman	54.6%	6.01
Medical Technologist or Technician	21.6	5.22
Medical Aide	8.3	2.28
Registered Nurse	3.7	5.17
Licensed Practical Nurse	1.5	3.60
Physical or Occupational Therapist	0.7	5.31
Social Worker	0.3	3.34
Other Medical Occupation	3.2	3.25
No Previous Medical Occupation	22.4	0
Average Number Years Experience For Total Study Sample		5.18

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[a] Since 16.3% of the respondents listed more than one previous medical occupation, the sum of the percentages exceed 100%.

medical occupation. Only half of the study sample had been corpsman. A somewhat greater percentage was anticipated since almost all of the earliest graduates were former corpsmen.

It is interesting to note that medical technologists and technicians constitute the second most frequently mentioned previous occupation. Former nurses, however, constitute less than 5% of the sample. Thus, Stead's (1967) preference for persons from fields other than nursing appears to have been realized. The paucity of former nurses in the physician assistant profession may derive from either the opposition among nursing professionals toward the physician assistant concept (for instance, see Rogers, 1972) or from expanding career opportunities within nursing as a result of the growing training and utilization of nurse practitioners.

The physician assistant programs attended by the sample are shown in Table 4. The Duke Physician Associate Program has trained 130 of our respondents, more than twice as many as any other program. Most programs, however, have 40 or fewer graduates represented in this study. Graduates of associate programs account for 30.7% of the sample and graduates of assistant programs, 39.8%. MEDEX and military program graduates are less numerous,

Table 4

Programs Attended By Physician Assistants

Physician Associate Programs	N	Percent (N=928)
Albany Medical College-Hudson Valley Community College (Albany, New York)	12	1.3%
Child Health Associate Program, University of Colorado	19	2.0
Duke University	130	14.0
Emory University	20	2.2
University of Oklahoma	31	3.3
State University of New York at Stony Brook	35	3.8
Touro College (Brooklyn, New York)	10	1.1
Yale University	28	3.0
subtotal	285	30.7
Physician Assistant Programs		
University of Alabama in Birmingham	61	6.6
Alderson-Broaddus College (Phillippi, West Virginia)	58	6.2
Baylor University	26	2.8
Bowman Gray School of Medicine (Winston-Salem, North Carolina)	48	5.2
University of Cincinatti	12	1.3
Cincinatti Technical College	9	1.0
Essex Community College (Baltimore, Maryland)	15	1.6
University of Florida at Gainesville	9	1.0
George Washington University	22	2.4
Hahnemann Medical College	18	1.9
University of Indiana	8	0.9
University of Iowa	6	0.6
Mercy College of Detroit	10	1.1

Table 4 (continued)

Physician Assistant Programs	N	Percent (N=928)
Northeastern University, (Boston, Massachusetts)	27	2.9
St. Louis University	17	1.8
University of Texas (Dallas)	2	0.2
University of Texas (Galveston)	15	1.6
U.S. Bureau of Prisons (Springfield, Missouri)	7	0.7
subtotal	370	39.8
MEDEX Programs		
Dartmouth College	54	5.8
Milton S.Hershey School of Medicine	12	1.2
University of North Dakota	34	3.8
University of Washington	58	6.3
MEDEX (unspecified)	16	1.7
subtotal	174	18.8
Military		
U.S.A.F.-University of Nebraska	27	2.9
U.S.A.F.-Sheppard A.F.B. (Texas)	31	3.4
U.S.A.F. (unspecified)	41	4.4
subtotal	99	10.7
total	928	100.0

accounting for 18.8% and 10.7%, respectively of the respondents.

A marked increase in the number of graduates of physician assistant programs in recent years is indicated in Table 5. The percentage of graduates completing their training has approximately doubled for each year between 1967 and 1974. Only 4.0% of the study sample graduated in 1970 or before compared to 29.7% in 1973 and 47.8% in 1974. The recency with which the study sample has completed its training should be kept in mind as later results are presented. A number of the characteristics of this new profession may change as its members reach later stages in their careers.

B. Changes in the Personal and Background Characteristics of More Recent Graduates

An examination of the personal and background characteristics of the more recent graduates reveals several important differences from those of earlier graduates. The number of years of post-high school education prior to beginning physician assistant training has gradually increased from 2.21 to 2.80 (see Table 6A). In Table 6B, one can also observe a decline in the percentage of former corpsmen, from 66.8% to 49.8%, among the more recent graduates. It is interesting to note that those with backgrounds

Table 5

Year of Graduation of Physician Assistants

Year of Graduation	Percent (N=922)
1967	0.1%
1968	0.9
1969	1.2
1970	1.8
1971	3.9
1972	14.6
1973	29.7
1974	47.8
	100.0

Table 6

Changes in Personal and Background Characteristics By Year of Graduation[a]

A. Number Of Years Of Formal Post-High School Education Before Beginning Training By Year Of Graduation

	1967-1972 (n=206)	1973 (n=273)	1974 (n=438)
number years of education	2.21 (s.d.=1.76)	2.55 (s.d.=1.74)	2.80 (s.d.=1.79)

B. Medical Background By Year Of Graduation

	1967-1972 (n=208)	1973 (n=274)	1974 (n=440)
corpsman (N=502)	66.8%	52.6	49.8
other medical field (N=213)	11.5	21.9	29.3
none (N=207)	21.7	25.5	20.9
	100.0	100.0	100.0

C. Program By Year Of Graduation

	1967-1972 (n=204)	1973 (n=273)	1974 (n=438)
associate (N=281)	39.2%	29.7	27.4
assistant (N=365)	22.1	39.2	48.6
MEDEX (N=172)	37.7	19.4	9.6
military (N=97)	1.0	11.7	14.4
	100.0	100.0	100.0

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[a] The relationships presented in this and subsequent tables are all significant at the .001 level or less.

in other medical fields account for 29.3% of the more recent graduates compared to only 11.5% of the earlier graduates. However, the percentage of those with no medical background has remained relatively constant.

Assistant and military programs account for an increasing percentage of the more recent graduates as shown in Table 6C. Although the percentage of graduates of associate programs has declined, the absolute number of graduates of this program type has continued to increase during the three time periods shown. The absolute as well as the relative number of MEDEX graduates, on the other hand, have both declined over time. We have found no significant changes in the age or sex of the more recent graduates, however.

Our findings support those of others which suggest that more recent graduates are better educated prior to physician assistant training and are less likely to be former corpsmen, (Detmer et al, 1972; Nelson, Jacobs, and Nelson, 1974; David Lewis, 1975). A dramatic shift in the educational backgrounds of Duke physician associate students has been reported by David Lewis (1975, p. 28). Among those entering training in 1971, only 23.3% had attended college. By 1975, however, 95.0% of the enrollees had already attended college, and 50.0% had obtained a college degree.

We suspect that changes in admission criteria explain only part of the trend toward the recruitment of more highly educated persons into the physician assistant profession. It would seem likely that more highly qualified persons have applied to these programs as knowledge of the opportunities available to physician assistants has become more widespread and as the job market for those with college-level training has become more competitive.

This trend has two significant implications for the physician assistant profession. First, as it attracts more academically qualified persons, its status relative to other occupations is enhanced. Secondly, the increasing number of trainees who already have a baccalaureate degree may encourage some programs to shift their training from an undergraduate to a graduate level. The University of Colorado Child Health Associate Program, for instance, offers a master's degree to its graduates.

The profession appears to be recruiting an increasing proportion of its members from non-nursing, civilian health fields. We suspect that this trend will continue. As awareness of the physician assistant profession becomes more widespread among non-nursing allied health professionals, increasing numbers are likely to be attracted to it as a means of career advancement in the health field.[1]

C. Influence of Personal and Background Characteristics Upon Performance During Physician Assistant Training

We consider next how the personal and background characteristics of physician assistants influence performance during training. Respondents were asked to rate their performance during training relative to their classmates in two different activities: basic science and classroom work, and patient care activities. A number of personal and background characteristics, as shown in Table 7, are related to these self-reported ratings of performance during training with somewhat different characteristics being related to each of these two dimensions of performance.

Those who are younger, those with more prior education, those with less prior medical experience, and those who had not been corpsmen rated their performance in basic science and classroom work

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[1] Lairson, Record, and James (1974) reported that many non-nursing allied health personnel at the Kaiser-Permanente program in Oregon became interested in this profession following the employment of physician assistants there. For a discussion of the limited career opportunities available to non-nursing allied health manpower, see Greenfield (1969, p. 145).

Table 7

Influence Of Personal And Background Characteristics Upon Performance During Physician Assistant Training

A. Correlations Between Performance During Training And Personal Or Background Characteristics

	Age	Interpersonal competence	Years of education	Years of medical experience
performance in basic science and class-room work	-.165 (N=928)	n.s.	.186 (N=925)	-.149 (N=931)
performance in patient care activities	n.s.	.174 (N=932)	.108 (N=925)	n.s.

Table 7 (continued)

B. Performance In Basic Science And Classroom Work During Training By Medical Background

	Corpsman (n=510)	Other Medical Field (n=215)	None (n=206)
performance in basic science and classroom work	3.20 (s.d.=0.62)	3.36 (s.d.=0.66)	3.41 (s.d.=0.60)

C. Performance In Patient Care Activities During Training By Sex Of Respondents.

	Men (n=777)	Women (n=155)
performance in patient care activities	3.49 (s.d.=0.53)	3.31 (s.d.=0.58)

more favorably. On the other hand, those who rated their interpersonal competence more highly, those with more prior education, and men rated their performance in patient care activities more favorably.

Although none of these relationships is particularly strong, they suggest that those who have been out of school longer encounter somewhat greater difficulty with the academic aspects of training. Consistent with previous findings (Crovitz, Huse, and Lewis, 1973b; Nelson, Jacobs, and Nelson, 1974), greater prior medical experience is not associated with better performance during training. Unlike Nelson, Jacobs, and Nelson (1974), however, we find a significant relationship between amount of prior education and level of performance during training.

II. Work Environment Characteristics

A. General Description

One of the major rationales for the development of the physician assistant profession has been to augment the supply of medical manpower in those specialties and in those geographic areas in greatest need of assistance. In this section we will consider the specialty and geographic distribution of physician assistants along with several additional features of their work environments such as type of practice setting and military versus civilian employment.

The specialty distribution of the sample is reported in Table 8. Family practice is the most frequently reported specialty, with 29.1% of the graduates. General internal medicine, general practice, and general surgery, constitute the other major specialties in which physician assistants are employed. Those working in the field of general primary care account for 43.6% of the study sample and those in specialty primary care, 29.3%. Thus, 72.9% of the study sample is involved in the provision of primary health care. Those working in surgery constitute 18.7% and those in other specialties, only 8.4%.

The specialty distribution for physician assistants has been compared to that for physicians in the United States in Table 9. The major difference between these two groups is that physician assistants are more likely to be working in primary care fields than are physicians. Although a similar percentage of each group are involved in specialty primary care and surgery, a substantially greater percentage of physician assistants are employed in general primary care fields while relatively few are located in other specialties.

Table 8

Specialty of Physician Assistants

	N	Percent (N=902)
General Primary Care		
family practice	262	29.1%
general practice	130	14.5
subtotal	392	43.6
Specialty Primary Care		
general internal medicine	166	18.6
general pediatrics	43	4.8
obstetrics and gynecology	16	1.8
emergency medicine	12	1.3
multispecialty primary care	25	2.8
subtotal	262	29.3
Surgery		
general surgery	107	11.9
orthopedic surgery	13	1.4
urologic surgery	13	1.4
plastic surgery	3	0.3
vascular surgery	2	0.2
neurosurgery	7	0.8
cardiothoracic surgery	20	2.2
surgical oncology	1	0.1
otolaryngology	4	0.4
subtotal	170	18.7
Other Specialties		
cardiology	12	1.3
nephrology	4	0.4
endocrinology	4	0.4
dermatology	4	0.4
hematology-oncology	5	0.6
gastroenterology	1	0.1
neurology	1	0.1
industrial and occupational medicine	16	1.8
rehabilitation medicine	1	0.1

Table 8 (continued)

Other Specialties	N	Percent (N=902)
pulmonary medicine	2	0.2
multi-subspecialty medicine	8	0.9
aerospace medicine	1	0.1
radiology	4	0.4
pathology	1	0.1
psychiatry	10	1.1
opthalmology	3	0.3
public health	1	0.1
subtotal	78	8.4
total	902	100.0

Table 9

Specialty Distribution Of Physician Assistants In Comparison With That Of Physicians In The United States

	Physician Assistants (N=902)	Physicians[a] (N=324,367)[b]
general primary care	43.6%	16.6%
specialty primary care	29.3	31.8
surgery	18.7	21.9
other specialties	8.4	29.7
	100.0	100.0

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[a] Source: American Medical Association (1974a, p.39)

[b] Includes federal as well as non-federal physicians involved in patient care

These findings, similar to those reported by the Comptroller General (1975), indicate quite clearly that the physician assistants are helping to expand the availability of primary care in the United States. Approximately three-quarters of the profession are engaged in the provision of primary health care services compared to only about half of the physicians in the United States. One of the original intents of federal support for physician assistant programs was to expand the supply of health professionals involved in the provision of primary medical care. At least from this standpoint, the policy goals of federal funding appear to have been realized.

In Table 10, the practice settings of physician assistants are presented and compared with those of physicians in the United States. The study sample is equally divided between those in private practice and those in institutional settings. There are slightly more physician assistants in private group practices than in private solo practices. Most of those employed in institutional settings work in clinics, but about half of this group also work in a hospital emergency or inpatient setting as well.

Although the exact same classification scheme

Table 10

Practice Settings of Physician Assistants and Physicians

A. Physician Assistant Practice Settings		Percent of Physician Assistants (N=870)
Private Practice		
private solo practice		21.2%
private group practice		28.6
	subtotal	49.8
Institutional Practice		
community or hospital clinic		21.7
hospital emergency room and/or inpatient unit		11.3
clinic and emergency room and/or inpatient unit		17.2
	subtotal	50.2
	total	100.0

B. Physician Practice Settings	Percent of Physicians [a] (N=272,850) [b]
office based practice	73.0%
hospital based practice	27.0
	100.0

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[a] Source: American Medical Association (1974a, p.14)

[b] Non-federal physicians involved in patient care

is not available for physicians, the "office based practice" category in Table 10B is comparable to our "private practice" category and the "hospital based practice" is comparable to our "institutional practice" category. Comparison of these analagous categories suggests that physician assistants are more likely to be working in institutional settings than are physicians.

The geographic distributions of physician assistants and physicians are presented in Table 11. Over a quarter of the civilians in the study sample are located in communities with populations less than 10,000 persons, and another quarter are located in communities having between 10,000 and 50,000 persons.

The available data for the geographic distribution of physicians is by county rather than community population. Even after allowing for the fact that county populations are generally larger than those of the communities located within them, there remains a rather substantial difference in the geographic distribution of these two groups. Assuming that all communities of less than 250,000 persons are located in counties having up to 500,000 persons (a conservative assumption), our data indicate that 73.0% of the civilian physician assistants compared to only 31.7% of

Table 11

Geographic Distribution Of Physician Assistants And Physicians

A. Geographic Distribution Of Physician Assistants[a]

population of community	Percent of physician assistants (N=801)
under 10,000	27.4%
10,000 to 49,999	25.3
50,000 to 249,999	20.3
250,000 to 999,999	14.5
over 1 million	12.5
	100.0

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[a] Civilians only

Table 11 (continued)

B. Geographic Distribution Of Physicians[b]

Population of County	Percent of physicians (N=270,412)[c]	Percent of U.S. population (N=209,448,200)	Physician population ratio (per 1000)
under 10,000	0.7%	2.2%	0.40
10,000 to 49,999	6.8	14.8	0.60
50,000 to 499,999	24.2	28.3	1.11
500,000 to 1 million	13.7	13.2	1.34
over 2 million	54.6	41.5	1.70
	100.0	100.0	

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[b] Source: American Medical Association (1974, pp.14 and 29)

[c] Non-federal physicians involved in patient care

physicians are located in counties of fewer than 500,000 persons. Counties with fewer than 500,000 persons also possess less than the national ratio of physicians per capita which, based upon the data shown in Table 11B, is 1.29 per 1,000 inhabitants. Thus, our data also suggests that approximately 73% of our sample are employed in counties with fewer than the national average of physicians.

Although we cannot be as precise as we would like, the data do permit the conclusion that physician assistants are considerably more likely than physicians to locate in smaller communities. It is also evident from Table 11B that the physician-population ratio is markedly less in smaller than in larger communities. Thus the availability of medical manpower is substantially less in smaller communities.

Our findings indicate that many physician assistants are locating in smaller communities where the need for additional medical services is greater. Over half of the profession is located in communities with less than 50,000 persons. Although the data available for physicians are not directly comparable, conservative estimates indicate that physician assistants are at least twice as likely as physicians to locate in counties with fewer than 500,000 persons and that approximately three-quarters of the physician assistants are working in counties with fewer than the national average of physicians.[3] Thus the policy goal of improving the geographic distribution of medical manpower by providing federal funds for physician assistant programs appears to have been successful.

Finally it is of interest to note that 12.8% of our respondents are presently employed by the military (not presented in the tables). This figure is quite comparable to the percentage of graduates who attended a military program as reported in Table 4. As we shall see shortly, there has been very little crossover of physician assistants between civilian and military employment. By and large, those who attended military physician assistant programs are still in the military, and those who attended civilian programs are still civilians.

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[3] These findings are slightly more favorable than those reported by the Comptroller General (1975). Sixty-five percent of the physician assistants in that study were located in counties having fewer than the national average of physicians. This difference may reflect sample differences since the Comptroller General's study included only 299 graduates of 9 programs. The difference may be due to methodological problems with our analysis, however. While the Comptroller General's report assessed the physician-population ratio of each county in which a physician assistant is located, we have utilized more indirect methods to make this comparison. Efforts to identify the county location for our respondents are underway and should provide additional clarification of this latter issue.

B. Influence of Personal and Background Characteristics Upon the Choice of Work Environments

Only two personal and background characteristics are significantly related to a physician assistant's choices of specialty, practice setting and geographic location: the sex of the physician assistant and the type of physician assistant program attended. These findings are presented in Table 12.

In Table 12A it can be seen that men are more likely to choose a general primary care or surgical field while women are more likely to choose a specialty primary care field. The specialty distributions of graduates of associate and assistant programs, shown in Table 12B, are quite similar. MEDEX and military program graduates, on the other hand, are more likely to be working in a primary care field, especially in general primary care. Two-thirds of associate and assistant graduates are working in either general or specialty primary care compared to 83.9% of MEDEX graduates and 95.8% of military graduates.

Table 12

Relationships Between Work Environment And Personal Or Background Characteristics

A. Specialty By Sex

	Men (n=755)	Women (n=147)
general primary care (n=392)	45.2%	34.7
specialty primary care (n=262)	26.2	43.5
surgery (n=170)	20.1	12.3
other specialties (n=78)	8.5	9.5
	100.0	100.0

B. Specialty By Program

	Associate (n=278)	Assistant (n=351)	MEDEX (n=168)	Military (n=95)
general primary care (n=388)	33.5%	36.2	64.9	62.1
specialty primary care (n=258)	33.1	29.0	19.0	33.7
surgery (n=170)	20.1	26.5	11.9	1.0
other specialties (n=76)	13.3	8.3	4.2	3.2
	100.0	100.0	100.0	100.0

Table 12 (continued)

C. Practice Setting By Program

	Associate (n=258)	Assistant (n=342)	MEDEX (n=162)	Military (n=98)
private solo (n=182)	22.5%	20.8	31.5	2.0
private group (n=247)	29.5	31.9	37.0	2.0
clinic (n=186)	18.6	18.7	15.4	50.0
hospital (n=96)	12.4	15.8	3.1	5.2
clinic and hospital (n=149)	17.0	12.8	13.0	40.8
	100.0	100.0	100.0	100.0

D. Community Size By Sex For Civilian Physician Assistants

	Men (n=655)	Women (n=146)
under 10,000 (n=219)	29.0%	19.9
10,000 to 49,999 (n=203)	27.0	17.8
50,000 to 249,999 (n=163)	19.5	24.0
250,000 to 999,999 (n=116)	13.7	17.8
1 million and over (n=100)	10.8	20.5
	100.0	100.0

Table 12 (continued)

E. Community Size By Program For Civilian Physician Assistants

	Associate (n=272)	Assistant (n=347)	MEDEX (n=168)
under 10,000 (n=215)	21.7%	23.9	43.5
10,000 to 49,999 (n=199)	23.9	24.2	29.8
50,000 to 249,999 (n=158)	25.0	19.3	13.7
250,000 to 999,999 (n=115)	14.7	16.7	10.0
1 million and over (n=100)	14.7	15.9	3.0
	100.0	100.0	100.0

The practice setting distributions of associate and assisant graduates, as shown in Table 12C, are almost identical, with approximately half working in private practice settings and the other half working in institutional settings. MEDEX graduates, however, are more likely to be working in private practice settings while military graduates are located almost exclusively in institutional settings.

In Table 12D we can also see that women are less likely than men to locate in small communities. Only 37.7% of women physician assistants compared to 56.0% of their male colleagues are working in communities with fewer than 50,000 persons. Differences in the geographic distribution of graduates of civilian programs are also readily apparent in Table 12E. MEDEX graduates are twice as likely as associate and assistant graduates to locate in a community having fewer than 10,000 persons.

It is possible that women are more likely to choose employment in specialty primary care fields in larger communities because it is more inconvenient for them to work long hours.[4] As we will see later in this chapter, women work fewer hours per week than men. Furthermore, jobs in specialty primary care fields and in larger communities tend to require fewer hours per week than other types of employment.[5] Furthermore, for married women physician assistants, the search for employment opportunities is likely to be limited to communities in which the husband can locate suitable employment. This need may influence many women physician assistants to locate in larger communities.

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[4] Specialty and community size are themselves related. Those working in larger communities are more likely to be employed in specialty primary care than in other fields. Table 1 in Appendix D describes this relationship.

The greater tendency of graduates of MEDEX compared to those of other civilian programs to locate in primary care settings and in smaller communities is important from a policy standpoint. It indicates that MEDEX programs have more successfully achieved the policy goal of training additional health manpower to work in areas of greatest need.

Three main factors appear to be responsible for this difference. First, the MEDEX programs themselves are located in geographic areas containing primarily smaller communities.[6] Second, MEDEX programs encourage those physicians in greatest need of assistance to consider employing a physician assistant. Third, MEDEX trainees obtain most of their training from practicing physicians who have committed themselves to hire the trainee following graduation.[7] None of the associate and assistant programs, on the other hand, attempt to influence the choice of employment of their graduates. From the policy perspective, it would appear that the deployment system of MEDEX programs has been successful and deserves consideration by other physician assistant programs.[8]

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[5] See Tables 25A, B, and D in this chapter.

[6] Two more recently established programs, the Drew MEDEX program in California and the Howard MEDEX program, are located in inner-city areas. Their graduates are not included in the study sample, however.

Those relationships between personal, background, and work environment characteristics which we have presented so far have not dealt with military versus civilian employment. As Table 13 indicates, there are some substantial differences in the personal and background characteristics of military and civilian physician assistants. On the average, military physician assistants are almost five years

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[7] For further explanations of the training and deployment methods adopted by MEDEX programs, see the following: Smith et al (1971), Smith (1972, 1973), National Council of MEDEX Programs (1974).

[8] A similar conclusion is contained in the Comptroller General's report (1975).

Table 13

Differences In Personal, Background, And Work Environment Characteristics Of Military Versus Civilian Physician Assistants

A. Military Versus Civilian Employment By Age of Respondent

	Age	S.D.
military (n=121)	34.36	5.65
civilian (n=818)	29.99	4.71

B. Military Versus Civilian Employment By Sex Of Respondent

	Men (n=783)	Women (n=156)
military (n=121)	15.2%	1.3
civilian (n=818)	84.8	98.7
	100.0	100.0

C. Military Versus Civilian Employment By Number Of Years Of Post-High School Education Prior To Beginning Physician Assistant Training

	years of prior education	S.D.
military (n=121)	1.80	1.99
civilian (n=811)	2.69	3.28

Table 13 (continued)

D. Military Versus Civilian Employment By Number Of Years Of Medical Experience Prior To Beginning Physician Assistant Training

	Years of prior medical experience	S.D.
military (n=121)	10.68	5.72
civilian (n=818)	4.36	5.34

Table 13 (continued)

E. Military Versus Civilian Employment By Program

	Associate (n=285)	Assistant (n=370)	MEDEX (n=174)	Military (n=99)
military employment (n=120)	2.8%	3.8	1.7	96.0
civilian employment (n=808)	97.2	96.2	98.3	4.0
	100.0	100.0	100.0	100.0

F. Specialty By Military Versus Civilian Employment

	military (n=115)	civilian (n=787)
general primary care (n=392)	59.1%	41.2
specialty primary care (n=262)	33.9	28.3
surgery (n=170)	1.7	21.3
other specialties (n=78)	5.3	9.2
	100.0	100.0

Table 13 (continued)

G. Practice Setting By Military Versus Civilian Employment

	Military (n=116)	Civilian (n=754)
private solo (n=184)	1.7%	24.1
private group (n=249)	6.9	32.0
clinic (n=189)	47.4	17.8
hospital (n=98)	4.3	12.3
clinic and hospital (n=150)	39.7	13.8
	100.0	100.0

older than their civilian counterparts and are almost exclusively men. Those in the military obtained nearly one year less of post-high school education but six years more medical experience prior to beginning training than did civilian physician assistants. In Table 13E, it can be seen that there has been very little movement of civilian graduates into the military or of military graduates into civilian employment. Finally, Tables 13F and G show that military physician assistants are more likely to be employed in general primary care fields and in institutional settings than are civilians.

III. Job Characteristics

A. General Description

The major job responsibilities listed by physician assistants are shown in Table 14. Two-thirds report that they diagnose and treat common medical problems of ambulatory patients. Other frequently mentioned responsibilities include history-taking, performing physical examinations, and providing emergency room care. A wide variety of additional responsibilities are also held by smaller numbers of respondents. Such duties include assisting in surgery, writing progress notes, counseling and psychotherapy, as well as other tasks.

Table 14

Major Job Responsibilities Of Physician Assistants

	Percent (N=939)
Primary care (diagnosis and treatment of common medical problems of ambulatory patients	68.5%
History taking and physical examination of ambulatory patients	29.3
Emergency room care	22.9
History taking and physical examination of hospitalized patients	16.3
Assisting in surgery	16.1
Making rounds on hospitalized patients	13.6
Suturing of minor wounds	12.8
Follow-up care	11.2
Nursing home visits	7.3
Initial screening and evaluation	7.3
Care of hospitalized patients	6.6
Writing hospital discharge summaries	6.6
Taking call during evening and weekend hours	6.1
Writing progress notes for hospitalized patients	5.4
Routine pre-operative and post-operative care	5.2
Lab work	5.0
Casting	5.0
Arranging and ordering lab studies	4.5
Home visits	3.4
Counseling and psychotheraphy	3.4
Reading electrocardiograms	2.0

A number of respondents described their responsibilities as equivalent to those of interns or residents. One physician assistant employed by a teaching hospital stated that "I have replaced the surgical intern on the Renal Transplant Unit and have taken over most of his patient care responsibility." Another states that he has "full house physician responsibility for approximately 30-35 inpatients and responsibility for 150 nursing home patients as well." A third physician assistant employed in a teaching hospital emergency room, states that he has "responsibilities for guiding interns through their rotations with my own supervising physicians often absent."

A small number of respondents indicated that their roles were essentially identical to those of practicing physicians. Some of these work without direct supervision in remote locations, such as in Alaska or foreign countries. Another physician assistant stated that he "functions as a general practitioner in a doctorless town." An additional respondent described his role as "a physician replacement rather than a physician extender." Although these persons represent only a small percentage of the study sample, they do demonstrate that physician assistants can, and in fact do, function in geographically remote areas where physicians are unavailable.

Respondents were asked to estimate the percentage of time at work which they spent in the various activities shown in Table 15. The typical physician assistant in our study sample spends over 80% of his time providing direct patient care, almost half of which is performed without a supervising physician physically present. Scheffler and Stinson (1974) collected similar data in 1972 from their sample of 155 physician assistants. They found that for the 22 physician assistants employed in "general medicine" who had changed jobs at least once, the percentage of time devoted to patient care under indirect physician surveillance had increased while time under direct surveillance had decreased. For our sample, however, the distribution of activities is unrelated to the number of years of experience as a physician assistant.

The respondents' assessments of their responsibility for patient care is shown in Table 16. Three-quarters state that they have either a "considerable" or a "great" amount of responsibility, but only half feel they have a "lot of influence" on the way the patients they see are cared for. Approximately two-thirds of the sample indicate

Table 15

Time Allocation Among Various Types Of Activities For Physician Assistants

	Percentage of time at work devoted to particular activity (N=939)
Patient care with supervising physician present	31.6%
Patient care with supervising physician absent	48.9
Technical or laboratory work	4.6
Clerical or secretarial work	4.3
Teaching other health professionals	5.5
Administration	2.1
Other activities	1.6

Table 16

Level Of Responsibility Of Physician Assistants For Patient Care

	Percent (N=939)
Great or a considerable amount of responsibility for patient care	77.1%
A lot of influence on the way patients are cared for	51.2
Authority to make decisions about patient care for which appropriate training has been obtained	66.2

that they are allowed to make decisions about patient care for which they received appropriate training. In another portion of the questionnaire (question 18), physician assistants were asked about the types of activities in which they would like to become more involved. Over half (55.4%) expressed a desire for additional patient care responsibilities. Although these findings are based upon subjective evaluations, they suggest that, despite the extent of their responsibility for patient care, a substantial number of physician assistants would nevertheless prefer greater autonomy and responsibility in patient management.

The average number of hours worked per week by the study sample is 50.41 (see Table 17). Respondents were also asked to indicate the average number of hours worked during evenings and on weekends. This result, also shown in Table 17, is 9.48 hours. Thus physician assistants report a substantially longer work week than the traditional 40 hours for the majority of those in the labor force.

It appears, then, that the major activity of physician assistants is the diagnosis and treatment of common medical problems of ambulatory patients, that 80% of their time is devoted to

Table 17

Number Of Hours Worked Per Week By Physician Assistants

	Number of hours (N=922)
Total number of hours worked per week	50.41
Number of hours worked during evenings and weekends	9.48

patient care, that they possess a moderate amount of responsibility for patient care, and that their work week is relatively long. We will consider next the quality and character of the relationships with those physicians, nurses, and patients with whom physician assistants work.

The supervisory support provided by physicians is generally considered to be quite adequate. For each aspect of supervision shown in Table 18 except one, 84% or more of the respondents rated their supervision as adequate. Only slightly over half of the sample, however, feel they receive enough help in improving their clinical skills.

Table 19 describes the physician assistants' assessments of the levels of role acceptance by the physicians, nurses, and patients with whom they work. Approximately one-fifth to one-quarter of the study sample encountered problems in various aspects of role acceptance by physicians and nurses as shown in Table 19A. While there were only minor differences reported for physicians and nurses in "obtaining assistance" or in "developing warm working relationships," problems in "acceptance of the physician assistant's role" were encountered somewhat more frequently with nurses. Most of these problems were reported to be relatively minor,

Table 18

Adequacy Of Support Provided By Supervising Physicians

	Percent who feel particular aspect of supervisory support is adequate (N=939)
Personal interest in the physician assistant	86.2%
Adequate consideration of questions	90.6
Adequate opportunity to present problems, complaints, or suggestions	86.2
Interest in ideas and suggestions	86.6
Recognition for work well done	84.1
Help in improving clinical skills	56.1
Interest in discussing problems of patient management	86.6

Table 19

Role Acceptance Of Physician Assistants By Physicians, Nurses, And Patients

A. Physician And Nurse Acceptance	Percent who encountered problems with physicians (N=939)	Percent who encountered problems with nurses (N=939)
Obtaining assistance when needed	24.4%	20.6
Following instructions given by P.A.	——	24.9
Developing warm working relationships	18.1	21.1
Acceptance of the P.A.'s role	18.1	27.9

B. Patient Acceptance	Percent (N=707)
Mean percentage of patients who prefer to see the physician assistant rather than a physician	44.2%
Mean percentage of patients who prefer to see a physician rather than the physician assistant	27.7

however. In fact, fewer than 5% of the sample rated any given problem in role acceptance as being of major importance.[9]

Items relevant to the physician assistants' perception of their role acceptance by patients are reported in Table 19B. Unfortunately, these two questions were left unanswered by approximately one-quarter of the study sample since many respondents indicated that they had little knowledge of their acceptance by patients. Those who did respond reported, on the average, that 44.2% of their patients prefer to see them rather than a physician. Only 27.7% of their patients were thought to prefer a physician to themselves. Thus 72.3% (i.e., 100.0%-27.7%) of the patients seen by these physician assistants are acceptors in the sense that they are perceived to be just as willing to see a physician assistant as a physician.

These findings suggest generally favorable levels of supervisory support and role acceptance with perhaps the sole exception being that almost half of the study sample feel the need for more help from their supervising physicians in improving their clinical skills. Problems in role acceptance were encountered slightly more frequently with nurses than with physicians, although these difficulties were generally thought to be minor. Our findings are thus in agreement with the favorable levels of role acceptance of physician assistants reported for physicians (Record and Greenlick, 1975), nurses (Laws and Elliott, 1972; Lairson, Record, and James, 1974), and patients (Komaroff, et al, 1974; Nelson, Jacobs, and Johnson, 1974).

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[9] We have considered physician supervisory support and physician role acceptance separately here. Because of the substantial correlation (.616) between these two scaled variables, they have been combined into a single scale for the bivariate and multivariate analyses which follow. We will refer to this resultant variable as "physician role support".

The final group of job characteristics to be considered describe the extrinsic rewards received from work, including income, occupational prestige, and job and career opportunities. The incomes of physician assistants in comparison to those of nurse practitioners, physicians, and hospital staff nurses are shown in Table 20. The mean income of the study sample is $14,285, over $5,000 more than the mean starting salary for hospital staff nurses but only approximately one-third to one-fourth of the net income reported by physicians. Although the mean income of nurse-practitioners is not available, information regarding the income distribution of a group of 146 nurse practitioners reported by the Comptroller

Table 20

Incomes Of Physician Assistants, Nurse Practitioners, Nurses, And Physicians

Physician Assistants	Percent (N=939)
less than $10,000	4.7%
$10,000 to $12,499	26.5
$12,500 to $14,999	30.6
$15,000 to $17,499	25.7
$17,500 to $19,999	6.0
$20,000 and over	6.5
	100.0
mean income	$14,285

Nurse Practitioners[a]	Percent (N=146)
less than $8,500	9.6%
$8,500 to $9,999	19.2
$10,000 to $11,499	21.2
$11,500 to $12,999	28.8
$13,000 to $14,499	13.0
$14,500 and over	8.2
	100.0

Physicians[b]	Net Income (1974)
General or family practitioners	$42,336
Internists	$47,229
Surgeons	$58,774
Obstetrician-Gynecologists	$57,119
Pediatricians	$40,027

Nurses[c]	mean starting salary (1974)
Hospital staff registered nurses	$9,096

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[a] Source: Comptroller General (1975, p.59)
[b] Source: American Medical Association (1974 b, p.199)
[c] Source: American Nurses' Association (1976)

General's office (1975) provides presumptive evidence that the mean incomes of physician assistants exceeds that for nurse practitioners. As Table 20 indicates, less than 8.2% of these nurse practitioners compared to 38.2% of physician assistants report incomes of $15,000 or more. These findings indicate that physician assistants receive substantially greater incomes than those in the nursing profession, but much less than physicians.

Despite their greater incomes, however, physician assistants consider their own occupational prestige to be almost identical to that of registered nurses (see Table 21). A marked discrepancy is observed between the prestige of physician assistants and physicians, however. The sample's rating of its own occupational prestige is considerably less than its rating of the prestige of physicians. The discrepancy between earnings and perceived prestige for physician assistants relative to nurses and physicians may imply some discontent with the symbolic rewards derived from work. The social recognition of the physician assistant profession by other health professionals and by patients may improve, though, as this new profession becomes more established in the health field.

The respondents' assessment of their job and career opportunities is shown in Table 22. A

Table 21

Occupational Prestige Ratings By Physician Assistants

Occupational Group Rated By Physician Assistants	N	Prestige Score	S.D.
physician assistants	868	60.7	18.2
registered nurses	877	58.0	17.1
physicians	880	90.7	12.3

Table 22

Job And Career Opportunities For Physician Assistants

A. Job Opportunities	Percent (N=913)
I already know of one or more positions available to me	43.2%
I could locate one with very little effort	11.7
I could find one without too much difficulty	29.0
It would be quite difficult to locate another job, but I could probably locate one eventually	14.8
It would be almost impossible to locate another job	1.3
	100.0

B. Career Opportunities in Present Job	Percent (N=928)
unlimited	7.3%
quite numerous	15.7
fairly numerous	17.3
limited	50.0
non existent	9.7
	100.0

rather marked difference exists in the general levels of these two types of opportunities. While only 16.1% state that it would be difficult to locate another job, 59.7% consider the opportunities for career advancement in their present position to be either limited or nonexistent.

In spite of the increasing numbers of graduates of physician assistant programs, the job market still appears to be quite favorable. Our findings for the career opportunities of physician assistants, on the other hand, indicate that problems in this area, as predicted by some (Breytspraak and Pondy, 1969; Mahoney, 1973), do in fact exist.

The respondents' perception of limited career opportunities for themselves is an important finding with significant implications. The initial rewards upon entering the physician assistant profession, (especially in terms of income and responsibility for patient care) appear to be quite attractive, particularly in comparison to those available to other allied health professionals. However, the opportunities for improving the level of these rewards as one advances in his career are considered by physician assistants to be rather limited.

It would not be surprising, then, if a number of physician assistants were considering and even preparing themselves for other types of work which appear to have greater career potential. Furthermore, if career opportunities remain limited, one might expect increasing discontent among those physician assistants with greater experience and possibly actual entry into other types of work.

Our findings concerning the career plans of the sample support this line of reasoning. A large number of the study sample indicate that they are planning to continue their education. As shown in Table 23A, one-fifth of the study sample plan to obtain a baccalaureate degree, one-fifth plan to obtain a master's degree, and almost a quarter state that they hope to enter medical school. The respondents' assessments of the likelihood of their entering a different occupational field indicate that most express an interest in alternative types of employment. As Table 23B shows,less than a third state that they would never consider a different occupation; another third have already considered another field and an additional third might do so in the future.

These findings indicate that the future plans of respondents reflect their perception of limited career opportunities persently available to them

Table 23

Career Plans Of Physician Assistants

A. Educational Plans	Percent (N=939)
obtain B.A. or B.S. degree	20.1%
obtain M.A. degree	21.7
obtain Ph.D. degree	6.1
enter medical school	22.7

B. Plans To Enter Another Occupational Field	Percent (N=939)
I have seriously considered entering a different field	11.0%
I have considered entering a different field, but not seriously	20.7
I have not yet considered entering a different field, but I might in the future	38.8
I would never consider entering a different field	29.5
	100.0

as physician assistants. A large portion of the sample is planning to continue their education, hoping to improve their chances for career advancement. A majority indicate that they are considering, or might consider in the future, leaving the physician assistant profession. Finally, respondents express a high degree of interest in becoming physicians. This is most likely due not only to the generally low level of career opportunities perceived by respondents for the physician assistant profession itself but also to the marked discrepancy between the incomes, occupational status, and levels of repsonsibility for patient care which exist between physicians and physician assistants. Although it is unfortunate that the physician assistant profession is viewed by many respondents as being unable to satisfy their career ambitions, these findings suggest that physician assistants are vitally interested in a rewarding career and are taking steps to achieve this goal.

The literature provides little information concerning the number of physician assistants who have actually been admitted to medical schools. Smith (in Pitcairn and Flahault, 1974, p. 120) stated that only one MEDEX graduate as of June, 1973, had entered medical school and Estes (in Pitcairn and Flahaut, 1974, p. 119) reported that none of the Duke graduates at that time had done so. Only one of our respondents is known to have gone on to medical school.

At the present time, physician assistants face considerable obstacles in entering the medical profession. They are usually older than the typical medical school applicant, they have families to support, and they usually need additional academic credits to meet medical school admission criteria. Furthermore, they face stiff competition from many who have superior academic records. In view of these circumstances, some (Smith et al, 1971) have proposed that opportunities for physician assistants to enter medical schools be expanded by awarding academic credit for medical knowledge and skills acquired previously. We expect that the issue of admission of physician assistants to medical schools will become increasingly important in the next few years as increasing numbers of this new profession seek to become physicians.

In summary, then, our review of the work related rewards of physician assistants has disclosed that their incomes are substantially greater than nurses', but far less than those of physicians. Physician assistants consider their own occupational prestige equal to that of nurses, but considerably lower than their assessment of the occupational prestige of physicians. Job opportunities for physician assistants appear to be plentiful, although career opportunities are considered to be rather limited. In response to the limited career opportunities available to physician assistants in their present position, many are planning to continue their education, and a significant proportion are considering entering other occupational fields. Almost a quarter of the sample have plans to enter medical school, although how realistic these plans are is difficult to assess.

B. Influence of Personal, Background, and Work Environment Characteristics Upon Job Characteristics

In this section we will examine relationships between job characteristics and those personal, background, and work environment characteristics included in our study. The job characteristics included in this analysis are level of responsibility for patient care, number of hours worked per week, physician role support, nurse and patient acceptance, income, occupational prestige, and job and career opportunities.[10] Only significant relationships between these variables will be presented.

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[10] See Table 2 in Appendix D for the correlations between these job characteristics.

Level of responsibility is considered first (see Table 24). Older physician assistants, those with more effective interpersonal competence, with greater medical experience prior to beginning physician assistant training, and with better performance in patient care activities during training report slightly more responsibility for patient care. Graduates of military physician assistant programs report considerably more responsibility for patient care than do graduates of civilian programs. This substantial difference is also evident in Table 24F where those employed by the military are compared with civilians. Those who graduated in 1974 report somewhat less responsibility than earlier graduates. Those working in surgical fields indicate less responsibility than those in other specialties, while those employed in clinic settings report greater levels of responsibility than those in other practice settings.

The most notable finding in Table 24 is the markedly greater responsibility for patient care reported by military physician assistants. The military has a long-standing tradition of delegation of substantial responsibility for patient care to allied health personnel. This custom appears to apply to military physician assistants as well.

Table 24

Relationships Between Level Of Responsibility And Personal, Background, And Work Environment Characteristics

A. Correlations With Level of Responsibility

	age	inter comp	no yrs exper	pt perf.
level of responsibility	.183 (N=936)	.126 (N=939)	.176 (N=939)	.128 (N=932)

B. Level Of Responsibility By Program

	associate (n=285)	assistant (n=370)	MEDEX (n=174)	military (n=99)
level of responsibility	10.27 (s.d.=1.66)	9.70 (s.d.=2.04)	10.13 (s.d.=1.62)	11.13 (s.d.=1.21)

C. Level Of Responsibility By Year Of Graduation

	1967-1972 (n=208)	1973 (n=274)	1974 (n=440)
level of responsibility	10.30 (s.d.=1.70)	10.35 (s.d.=1.54)	9.85 (s.d.=2.03)

Table 24 (continued)

D. Level Of Responsibility By Specialty

	general primary care	specialty primary care	surgery	other specialties
	(n=392)	(n=262)	(n=170)	(n=78)
level of responsibility	10.30 (s.d.=1.60)	10.20 (s.d.=1.78)	9.54 (s.d.=2.29)	10.08 (s.d.=1.61)

E. Level Of Responsibility By Practice Setting

	private solo	private group	clinic	hospital	clinic and hospital
	(n=184)	(n=249)	(n=189)	(n=98)	(n=150)
level of responsibility	9.89 (s.d.=1.75)	9.69 (s.d.=2.03)	10.63 (s.d.=1.50)	9.70 (s.d.=2.24)	10.61 (s.d.=1.49)

F. Level Of Responsibility By Civilian Versus Military Employment

	military	civilian
	(n=121)	(n=818)
level of responsibility	11.06 (s.d.=1.20)	9.96 (s.d.=1.86)

As one of these remarked,

> I feel that at times I have responsibility over and above what should be expected of a physician assistant. But, that's the military!

One might suspect that the difference in responsibility for patient care between military and civilian physician assistants accounts for a number of the other findings in Table 24 as well since military physician assistants are older, have had more prior medical experience, and are working primarily in non-surgical specialties in clinic settings. Examination of the relationships shown in Table 24 after omitting military physician assistants from the analysis indicates, however, that all of these relationships except one remain. There is no significant correlation between number of years of medical experience prior to beginning training and level of responsibility among civilian physician assistants.

The slightly greater responsibility reported by those with greater experience as physician assistants seems logical, although one might expect somewhat greater differences. Those who graduated between 1967 and 1972 report no more responsibility than those graduating in 1973. Furthermore, as we mentioned previously, earlier graduates report just as much direct physician supervision as more recent graduates. Thus, the increase in level of responsibility as one's experience as a physician assistant increases appears to be quite small. This may be one of the reasons physician assistants consider their career opportunities to be so limited.

The lesser amount of responsibility reported by those working in surgery is not surprising since their major duty is generally to assist in surgery, a task which allows little opportunity for independent action. The greater responsibility reported by those working in clinic settings can most plausibly be attributed to the tendency of supervising physicians in these settings to feel less obligation to personally provide patient care than do supervising physicians in private practice. Clinic patients typically possess low incomes and have few, if any, alternative sources of care. Furthermore, the turnover among clinic physicians is relatively high. Thus, doctor-patient relationships are typically not well developed and delegation of responsibility to physician assistants is more easily accomplished in these settings.

From Table 25 it can be seen that women physician assistants work about 5 hours less per week

Table 25

Relationships Between Number Of Hours Worked Per Week And Personal, Background, And Work Environment Characteristics

A. Number Of Hours Worked By Sex

	Men (n=772)	Women (n=150)
number of hours worked	51.15 (s.d.=12.41)	46.60 (s.d.=13.70)

B. Number Of Hours Worked By Specialty

	general primary care (n=387)	specialty primary care (n=262)	surgery (n=163)	other specialties (n=77)
number of hours worked	51.89 (s.d.=11.80)	47.44 (s.d.=11.40)	54.52 (s.d.=14.87)	46.94 (s.d.=13.46)

C. Number Of Hours Worked By Practice Setting

	private solo (n=180)	private group (n=246)	clinic (n=188)	hospital (n=96)	clinic and hospital (n=147)
number of hours worked	53.96 (s.d.=14.48)	50.57 (s.d.=10.49)	46.80 (s.d.=10.68)	50.78 (s.d.=13.70)	51.59 (s.d.=14.62)

Table 25 (continued)

Correlation Of Number Of Hours Worked With Community Size

	community size
number of hours worked	-.199 (N=907)

than men. Those in surgery and general primary care report longer work weeks than those in other specialties. Physician assistants employed in private solo practices work more hours per week than those in other practice settings, especially clinics. Finally, those employed in smaller communities have longer work weeks as well.

We discussed earlier the possibility that women physician assistants choose specialty primary care fields in larger communities more frequently than men partly because the hours associated with employment in these settings are more suited to their needs. This interpretation is consistent with the data in Table 25 which indicate that those in specialty primary care fields and in larger communities have shorter work weeks.

Those employed in general primary care specialties and in private solo practices are more likely to be located in smaller communities. The longer work weeks typical of such settings probably reflect the greater demands for medical care which exist in smaller communities.

Turning now to variables characterizing the quality of interpersonal relations at work, we find that they are minimally influenced by personal, background, and work environment characteristics. None of these characteristics are significantly related to either physician role support or patient acceptance. Several significant relationships were obtained for nurse acceptance, however. These findings are shown in Table 26.

Graduates of associate programs report slightly more favorable levels of nurse acceptance than do other physician assistants. In addition, those with more experience as physician assistants encounter fewer problems in nurse acceptance.

Why associate graduates should encounter more favorable nurse acceptance than other graduates is not readily apparent. It may be that the more extensive prior education obtained by associate graduates makes them more legitimate incumbents of the physician assistant role from the nurse's viewpoint.[11] Another possibility is that the more academically oriented training received by associate graduates causes nurses to consider these physician assistants to be more qualified than others.

Our finding of more favorable nurse acceptance

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[11] For evidence regarding the educational backgrounds of graduates of different types of physician assistant programs, see Table 3 in Appendix D.

Table 26

Relationships Between Nurse Acceptance And Background Characteristics

A. Nurse Acceptance By Type Of Physician Assistant Program Attended

	associate (n=285)	assistant (n=370)	MEDEX (n=174)	military (n=99)
nurse acceptance	11.10 (s.d.=1.64)	10.50 (s.d.=2.09)	10.76 (s.d.=1.92)	10.53 (s.d.=1.98)

B. Nurse Acceptance By Year Of Graduation

	1967-1972 (n=208)	1973 (n=274)	1974 (n=440)
nurse acceptance	11.05 (s.d.=1.73)	10.74 (s.d.=1.89)	10.57 (s.d.=2.03)

among earlier graduates is consistent with Breer, Nelson, and Bosson's (1975) observation that physician assistants not infrequently encountered problems in nurse acceptance during the initial stage of employment which gradually subsided with the passage of time. Earlier graduates are more likely to have been employed in a particular practice setting for a longer period than recent graduates. Furthermore, with increasing experience, physician assistants may develop greater skill in working effectively with nurses and thus encounter greater role acceptance.

The most striking aspect of these findings, however, is our inability to account for the variation in the quality of interpersonal relations reported by the study sample. Other variables which were not assessed but which might influence the quality of interpersonal relations reported by physician assistants include personality characteristics of physician assistants themselves as well as characteristics of the physicians, nurses, and patients with whom the physician assistant interacts.

The lack of association between the physician assistant's interpersonal competence and the quality of interpersonal relationships is especially puzzling. This may indicate that the physician assistant's interpersonal competence in fact has little influence upon the role acceptance which he receives from others, or it may suggest problems in the validity of the interpersonal competence measure itself. Perhaps the personalities of the physicians, nurses, and patients are the overriding factors. Another possibility suggested by Record and Greenlick (1975) is that role acceptance is affected by the extent to which the physician assistant enables others to pursue more highly valued activities. Additional research will be required to assess the validity of these explanations.[12]

Work-related rewards constitute the final group of job characteristics for which the influence of prior variables has been assessed. These rewards include income, occupational prestige, and job and career opportunities. The results concerning income are shown in Table 27.[13]

Physician assistants who are older, those who rate their interpersonal competence more favorably,

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[12] Another variable which does influence role acceptance is the physician assistant's job performance. This finding will be discussed in the following chapter.

[13] The dollar values reported in this table are those which were current in 1974.

Table 27

Relationships Between Income And Personal, Background, And Work Environment Characteristics

A. Correlations With Income

	age	inter comp	no yrs exp	acad perf	pt perf
income	.111	.109	.114	.113	.154
	(N=908)	(N=911)	(N=904)	(N=904)	(N=904)

B. Income By Sex

	men	women
	(n=765)	(n=146)
income	$14,573	$12,777
	(s.d.=$4,412)	(s.d.=$2,745)

C. Income By Program

	associate	assistant	MEDEX	military
	(n=282)	(n=356)	(n=163)	(n=99)
income	$15,559	$13,857	$14,026	$12,454
	(s.d.=$4,722)	(s.d.=$4,194)	(s.d.=$3,725)	(s.d.=$2,323)

Table 27 (continued)

D. Income By Year Of Graduation

	1967-1972 (n=199)	1973 (n=267)	1974 (n=428)
income	$15,629 (s.d.=$4,183)	$14,748 (s.d.=$5,310)	$13,387 (s.d.=$3,199)

E. Income By Military Versus Civilian Employment

	military (n=120)	civilian (n=791)
income	$12,587 (s.d.=$2,318)	$14,543 (s.d.=$4,404)

those who obtained more experience prior to beginning physician assistant training, and those who performed better in patient care activities during training report slightly greater incomes. There is also a substantial difference in the incomes of men compared to women in the study sample, with men earning almost $1,800 more per year on the average than women.

Substantial differences in income also exist between graduates of different types of programs, between more recent compared to earlier graduates, and between military compared to civilian employees. Graduates of associate programs earn over $1,500 more per year than graduates of other civilian programs. There is also a moderate increase in income as the physician assistant's experience increases. Starting salaries are approximately $1,400 less than salaries for those in their second year following graduation and over $2,200 less than for those who have been working longer as physician assistants. Our data indicate that those 19 physician assistants who graduated in 1969 or before possess an average salary of $18,050 (not shown in Table 27). There is also about a $2,000 difference in the earnings of military and civilian physician assistants. Military incomes have not been adjusted to include fringe benefits, however. These benefits, which include medical care, commissary privileges, transportation, and retirement benefits, have been estimated to represent 30% of the total economic benefits received by military personnel (Department of Defense, 1976). On this basis, then, military physician assistants earn the equivalent of approximately $18,000, considerably more than the $14,543 reported by civilian physician assistants.

Sizeable differences between the incomes of men and women physician assistants have been reported by Scheffler and Stinson (1973) on the basis of their 1972 survey results. At that time they found a $2,000 difference, though the average salary for their entire study sample was only $9,869. They noted that women were more likely to be located in lower paying specialties and in metropolitan areas where salaries were lower on the average. After controlling for these variables, however, Scheffler and Stinson still found that women received lower incomes.

In our study, we have found no significant differences in income between specialties[14] or between larger versus smaller communities which might account for the observed differences between men and women in the study sample. We did, however, find one important difference between men and women which is obviously related to income: the number of hours worked per week. Assuming that all respondents work 50 weeks per year, we find that men earn $5.76 per hour on the average while women earn only slightly less, $5.49. Allowing for time and one-half pay for evening and weekend work reduces these differences still further. Men report 10.66 hours worked per week during these periods compared to 6.71 for women. Recomputing earnings per hour by awarding time and one-half pay for evening and weekend work yields essentially identical earnings for men and women: $5.11 per hour compared to $5.04, respectively. Based on these calculations, then, the difference in actual earnings per hour between men and women appear to be minimal.

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[14] Since we have found no significant difference in income between specialties or between practice settings, the concerns raised by Sadler, Sadler and Bliss (1972, pp. 28-29) that physician assistants are offered greater salaries to work in subspecialty private practice settings appear to be unwarranted.

The higher incomes of graduates of associate programs are probably due to more favorable assessments by their employers of the quality of their training as well as their greater prior educational attainments. The incomes of military physician assistants are artificially deflated since servicemen receive sizeable fringe benefits. Using an estimate of the economic value of these benefits, the incomes of military physician assistants appear to be over $4,000 more than that of those in civilian employment.

The greater incomes of earlier graduates suggests that those entering the physician assistant profession can expect salary increments of approximately $1,000 per year during their early years in the field. Similar findings have been obtained by Scheffler and Stinson (1973). It is still too early to know at what level and how many years following graduation their salaries will plateau but our own data suggest that after five or six years of experience, physician assistants can expect a salary of approximately $18,000 on the average.

The next work-related reward to be considered is perceived occupational prestige. In Table 28 it can be seen that those respondents who are older and those who completed their physician assistant training earlier consider their occupational prestige to be greater. The other personal, background, and work environment characteristics included in our analysis are unrelated to this particular work-related reward. These findings suggest that physician assistants develop a somewhat more favorable conception of the social standing of their profession as they grow older and as they become more experienced.

Turning now to job opportunities, we find that the prior variables associated with this particular work-related reward are more numerous. The

Table 28

Relationships Between Perceived Occupational Prestige And Personal Or Background Characteristics

A. Correlation Between Perceived Occupational Prestige And Age

	age
prestige	.121 (N=865)

B. Perceived Occupational Prestige By Year Of Graduation

	1967-1972	1973	1974
	(n=190)	(n=253)	(n=408)
prestige	63.88 (s.d.=17.36)	62.40 (s.d.=17.61)	57.87 (s.d.=18.56)

perceived availability of job opportunities is positively related to age, interpersonal competence, number of years of prior medical experience, and performance in patient care activities during training. Men report more opportunities than women as do corpsmen compared to those with backgrounds in other medical fields or those with no prior medical experience. Earlier graduates as well as graduates of associate programs and military physician assistants also report more job opportunities (see Table 29).

Prior medical experience, effective interpersonal skills, favorable clinical performance during training, graduation from an associate program, and greater experience as a physician assistant are all likely to make the physician assistant a more attractive job candidate to potential employers. Women may perceive substantially fewer job opportunities because of limitations on their geographical mobility arising from family ties and their tendency to prefer jobs in larger communities. There appears to be a greater demand for the services of physician assistants in the military than in civilian employment. This may result from possible medical manpower shortages which have arisen in the military since the termination of the doctor draft.

Table 29

Relationships Between Job Opportunities And Personal, Background, And Work Environment Characteristics

A. Correlations With Job Opportunities

	age	inter. comp.	no.yrs. exp.	pt. perf.
job opportunities	.124 (N=911)	.142 (N=913)	.126 (N=913)	.152 (N=908)

B. Job Opportunities By Sex

	men (n=760)	women (n=153)
job opportunities	3.91 (s.d.=1.14)	3.29 (s.d.=1.26)

C. Job Opportunities By Medical Background

	corpsman (n=501)	other medical field (n=207)	none (n=205)
job opportunities	3.94 (s.d.=1.10)	3.74 (s.d.=1.23)	3.54 (s.d.=1.27)

Table 29 (continued)

D. Job Opportunities By Program

	associate (n=276)	assistant (n=362)	MEDEX (n=168)	military (n=96)
job opportunities	4.05 (s.d.=1.11)	3.56 (s.d.=1.25)	3.74 (s.d.=1.11)	4.16 (s.d.=1.04)

E. Job Opportunities By Year Of Graduation

	1967-1972 (n=202)	1973 (n=268)	1974 (n=428)
job opportunities	4.08 (s.d.=1.09)	3.81 (s.d.=1.17)	3.70 (s.d.=1.21)

F. Job Opportunities By Military Versus Civilian Employment

	military (n=116)	civilian (n=717)
job opportunities	4.16 (s.d.=1.04)	3.75 (s.d.=1.19)

The prior variables which influence the perception of career opportunities are shown in Table 30. Interpersonal competence enhances one's career opportunities. Graduates of MEDEX and military programs perceive more limited career opportunities than do other graduates. The military physician assistants' lower level of perceived career opportunities may result from the limits on their earning potential within the military and on the opportunities for additional patient care responsibilities in light of the substantial level already possessed.

IV. Summary

In the preceeding analysis we have described a number of the general characteristics of the study sample as well as some of the relationships between these variables. Because the findings are too numerous to be recapitulated here, we will summarize only those which are considered to be of greatest importance.

Perhaps our most important observation is that physician assistants are working in specialties and in geographic locations generally recognized as being in need of additional manpower. Approximately three-fourths of our respondents are work-

Table 30

Relationships Between Career Opportunities And Personal, Background, And Work Environment Characteristics

A. Correlation Of Career Opportunities With Interpersonal Competence

	interpersonal competence
career opportunities	.132 (N=928)

B. Career Opportunities By Program

	associate (n=282)	assistant (n=364)	MEDEX (n=172)	military (n=99)
career opportunities	2.67 (s.d.=1.11)	2.74 (s.d.=1.13)	2.45 (s.d.=1.04)	2.22 (s.d.=0.78)

C. Career Opportunities By Military Versus Civilian Employment

	military (n=121)	civilian (n=807)
career opportunities	2.30 (s.d.=0.85)	2.65 (s.d.=1.11)

ing in primary care fields (especially general or family practice), and almost 70% indicate that their major job responsibilities include the provision of primary medical care. Furthermore, over half are working in communities of less than 50,000 persons.

A comparison of the specialty and geographic distributions of physician assistants with those of the medical profession suggests that physician assistants are more likely than physicians to be working in primary care fields and in smaller communities. Thus, the physician assistant profession appears to be fulfilling a recognized need in the provision of health care in the United States.

The actual impact of the physician assistant profession on the undersupply of primary care services and the shortage of medical personnel in smaller communities has not yet been substantial because of the small size of the profession at present. With its further growth and a continuation of the present patterns of choice of specialty and geographic location, the future contribution of physician assistants to these problems should be quite important.

A second set of important observations presented in this chapter concerns the respondents' perception of their career opportunities and their career plans. Sixty percent of the sample consider the opportunities for career advancement in their present positions to be either "limited" or "non-existent". In view of these circumstances, many physician assistants indicate that they are intending to continue their education. One-fifth of the sample plan to obtain a master's degree and almost one-fourth are hoping to enter medical school. One-third of the study sample has already considered entering another occupational field, and another third report that they might do so in the future.

These findings indicate that most physician assistants consider their career opportunities in this new profession to be rather unattractive and they are planning to pursue career opportunities in other fields if necessary. The creation of viable career advancement opportunities within the physician assistant profession, then, appears to be a task of major importance for the next few years. Our findings suggest that there is likely to be a significant attrition of physician assistants into other fields if career opportunities are not expanded.

The personal and background characteristics of the respondents indicate that the physician assistant profession is likely to remain predominately male. In spite of the relatively fewer former corpsmen entering the profession, the percentage of women among the more recent graduates has not increased significantly. Those with backgrounds in nursing continue to represent only a small minority of the more recent graduates, while the recruitment of those with backgrounds as medical technicians or technologists has increased substantially. Finally, the academic preparation of more recent graduates is more extensive, consisting of almost three years of post-high school education or training before entering a physician assistant program.

If present trends continue, the physician assistant profession will soon be composed predominately of those with backgrounds in non-nursing allied health fields who graduated from college before entering physician assistant training. Thus the physician assistant profession may become an important source of career mobility for civilian health workers who would otherwise have reached the apex of their careers with no significant opportunities for advancement ahead of them. The increasing educational backgrounds of physician assistants may prompt programs to begin awarding a master's rather than a bachelor's degree to their graduates.

Although career opportunities are considered to be rather limited, other job characteristics, on the whole, are quite favorable. Incomes appear to be substantially greater than those received by nurses or nurse practitioners, with significant increments in earning being reported by those with greater experience. Favorable levels of supervisory support as well as physician, nurse, and patient acceptance are reported by respondents. Finally, job opportunities are considered by respondents to be plentiful in spite of the exponential annual growth in the number of graduates.

The physician assistant profession, then, appears to be making a useful contribution to the provision of health services in the United States by supplying additional medical manpower for those specialties and geographic areas in need of supporting personnel. Although the career opportunities for these new professionals are less than optimal, other job characteristics are quite favorable. Having described various characteristics of physician assistants and their professional experiences, we will now direct our attention in the following chapter to an assessment of their job performance and job satisfaction.

CHAPTER IV

JOB PERFORMANCE AND JOB SATISFACTION

In this chapter we will present our findings concerning the general levels of job performance and job satisfaction of physician assistants as well as the relationships which exist between these and other study variables. We will begin our discussion with an analysis of job performance.

I. Job Performance

A. General Level of Performance

Three measures of job performance have been included in the present study: self-ratings of job performance, supervising physicians' ratings of job performance, and supervising physicians' satisfaction with the physician assistant's work. The general level of performance of the sample is perhaps best expressed by the supervising physicians' satisfaction with the physician assistant's work, shown in Table 1. Three-quarters of the supervising physicians are "greatly satisfied" with the work of their physician assistant and an additional 19.0% are "moderately satisfied". Only 5.3% express lesser degrees of satisfaction. Physicians were also asked whether they would hire the same physician assistant if they "had it to do over again". Three-quarters of the supervising physicians would "definitely" rehire the same physician assistant, and another 16.3% indicate that

Table 1

Supervising Physician's Evaluation Of Physician Assistant

A. Level Of Satisfaction With Physician Assistant's Work	Percent (N=662)
greatly satisfied	75.7%
moderately satisfied	19.0
mildly satisfied	2.7
mildly dissatisfied	0.9
moderately dissatisfied	0.9
greatly dissatisfied	0.8
	100.0

B. Whether Or Not He Would Rehire The Same Physician Assistant If He "Had It To Do Over Again"	Percent (N=662)
definitely yes	77.0%
probably yes	16.3
probably not	3.5
definitely not	3.2
	100.0

they would "probably" do so. Only 6.7% state that they would not hire the same physician assistant.

These results suggest that supervising physicians are favorably impressed with the performance of their physician assistant. Crovitz, Huse, and Lewis (1973a) reported similar results. In their study, 73.3% of 60 physicians supervising Duke graduates rated the performance of their physician assistant as either "outstanding" or "excellent" and 86.6% were "definitely" going to renew their yearly contract.

It may be the case that these findings overstate somewhat the favorable levels of physician assistant performance since we have no information for almost a third of the supervising physicians. Although our findings are thus based on incomplete returns, it nevertheless seems unlikely that the inclusion of ratings from these remaining supervising physicians would substantially alter the general conclusion that a favorable level of perforamnce exists in the study sample.

B. Relationships Between Job Performance and personal, Background, Work Environment, and Job Characteristics

The correlations between our three performance measures are shown in Table 2. The two supervisory ratings are themselves highly correlated, but neither

Table 2

Intercorrelations Of Job Performance Measures [a]

	Self-rating of job performance	Supervising M.D.'s rating of job performance	Supervising M.D.'s level of satisfaction with P.A.'s work
Self-rating of job performance	1.000		
Supervising M.D.'s rating of job performance	.138 (N=654)	1.000	
Supervising M.D.'s level of satisfaction with P.A.'s work	n.s.	.656 (N=654)	1.000

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[a] All relationships shown in this and subsequent tables are significant at the .001 level or less.

correlates substantially with the self-rating performance measure. Thus it appears that the self-rating measures and the physician rating measures pertain to relatively independent domains of performance,or at least to quite different perceptions of levels of performance. In view of these differences, we will include each of these performance measures in our analysis of the relationships which exist between performance and personal, background, work environment, and job characteristics.

Tables 3 and 4 present the significant relationships obtained between job performance measures and other study variables. The strongest correlate of self-ratings of performance is level of responsibility for patient care, at .40. Other variables correlating between .20 and .30 with this performance measure include interpersonal competence, performance in patient care activities during training, the level of physician role support, and the number of alternative job opportunities available to the respondent.

Weaker but still significant relationships with self-ratings of performance were obtained for sex, medical background, age, number of years of medical experience prior to becoming a physician assistant, nurse acceptance, patient acceptance, income, perceived occupational prestige, and perceived career opportunities. Men, former corpsmen, those

Table 3

Relationships Of Self-Ratings Of Job Performance With Personal And Background Characteristics

A. Self-Rating Of Job Performance By Sex

	men (n=783)	women (n=156)
self-rating of job performance	15.77 (s.d.=2.22)	14.79 (s.d.=2.25)

B. Self-Rating Of Job Performance By Medical Background

	corpsman (n=513)	other medical field (n=216)	none (n=210)
self-rating of job performance	15.89 (s.d.=2.09)	15.41 (s.d.=2.44)	15.13 (s.d.=2.44)

Table 4

Correlations Of Job Performance Measures With Personal, Background, And Job Characteristics

	age	inter comp	no yrs exp	pt perf	Lev resp	MD role sup
Self-rating of job performance	.136 (936)	.252 (939)	.158 (939)	.259 (932)	.400 (939)	.250 (939)
Supervising M.D.'s rating of job perform.	n.s.	n.s.	n.s.	n.s.	.135 (654)	.271 (654)
Supervising M.D.'s level of satisfaction with physician assistant's work	n.s.	n.s.	n.s.	n.s.	.124 (662)	.296 (662)

Table 4 (continued)

Correlations Of Job Performance Measures With Personal, Background And Job Characteristics

	nurse accep	patient accep	income	prestige	job opp	car opp
Self-rating of job performance	.116 (939)	.118 (705)	.170 (911)	.146 (868)	.230 (913)	.162 (928)
Supervising M.D.'s rating of job performance	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Supervising M.D.'s level of satisfaction with physician assistant's work	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

who are older, those with greater prior medical experience, and those with more favorable job characteristics rated their job performance slightly more favorably. Physician ratings of job performance, on the other hand, are significantly related to only two variables, level of responsibility for patient care and level of physician role support, with correlations of approximately .13 and .28 respectively.

The only variables, then, consistently related to all three performance measures are level of responsibility for patient care and level of physician role support. The interpretation of these relationships is not straightforward, however. Does more effective job performance result in greater patient care responsibility and greater physician role support, or do greater responsibility and greater physician role support produce more effective job performance? We consider each of these possibilities to be plausible and therefore it must be assumed that some degree of reciprocity exists in these relationships. Thus the most we can conclude at this point is that job performance, responsibility for patient care, and physician role support are all positively related.

In contrast to these variables consistently related to each of our three performance measures, several study variables exhibit no significant relationships with any of these performance measures. Those variables which have no demonstrable impact upon job performance are as follows:

(a) number of years of education before beginning physician assistant training

(b) type of physician assistant program attended

(c) performance in basic science and classroom work during training

(d) year of graduation

(e) specialty

(f) practice setting

(g) size of community in which physician assistant is employed

(h) military versus civilian employment

There is a third group of variables which are related to self-ratings of performance but not to physician ratings. The more favorable job performance rating by those who have had more medical experience before becoming a physician assistant, by those who rate their interpersonal competence more highly, and by those who performed more effectively in patient care activities during training suggests that these characteristics may contribute to self-confidence in one's abilities to satisfy the role requirements of a physician assistant. Thus one's self-confidence, which may be unrelated to actual role performance, would appear to influence perception of one's own job performance.

We would also postulate that the physician assistant interprets the characteristics of his job as reflecting his own performance. For instance, one small study has concluded that physician assistants "use the physician's increasing delegation of patient responsibility as the best available index of their performance" (Fine and Machotka, 1973, p. 674). We suspect this to be the case for physician assistants in general. Additionally, while the level of responsibility delegated to them may be considered the best single index of performance (hence most highly correlated with self-ratings of performance), other job characteristics such as physician role support, nurse and patient acceptance, income, job opportunities, and career opportunities may also serve this function. Thus, for instance, the physician assistant with more favorable patient acceptance or job opportunities is likely to consider his performance to be responsible for these conditions. In reality, factors other than his performance may be equally important. For example, patient acceptance may be affected by the availability of medical care in the area,[1] and job opportunities may be to a large extent determined by the general or local condition of the job market for physician assistants.

Self-ratings of performance, then, appear to be partly influenced by background and job characteristics, some of which may enhance confidence in one's own abilities without influencing one's actual performance. The physician assistant's perception of his performance thus appears to be influenced by a number of considerations which are not taken into account by the supervising physician in his evaluation.

We interpret the physician's evaluation to be the better measure of actual performance. Because the supervising physician works quite closely with the physician assistant in most cases, he should be able to assess rather accurately the physician assistant's level of performance. Furthermore, his perception of the physician assistant's performance is not likely to be influenced by extraneous factors to the same degree as are self-evaluations.

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[1] See Nelson, Jacobs, and Johnson (1974) for supporting evidence.

Even though we are inclined to view the physician rating as the more valid criterion of performance, one might argue that both types of ratings are equally valid, though emphasizing different dimensions of performance or using different reference standards for comparison. For instance, the supervising physician's evaluation may be based primarily upon the physician assistant's technical or medical skills while the physician assistant may place greater emphasis upon his interpersonal skills in patient management (a possible explanation for the sizeable correlation between interpersonal competence and self-rating of performance).

Physician assistants may also be more likely to compare their performance to that of other physician assistants, while supervising physicians may consider physician or nurse performance as a reference standard since they are unlikely to be aware of the performance of other physician assistants. This would explain the sizeable correlation of performance during training with self-ratings of job performance but not with physician ratings. The last opportunity most physician assistants had to compare their performance with other physician assistants was during training, and they probably consider their class standing as a valid indicator of their present performance relative to other physician assistants.

Additional research might profitably investigate further the reasons for the low correlation between self and supervisory ratings of performance as well as for the different correlates of each. We are not the first to observe a low correlation between such measures. Kegel-Flom (1971) found correlations ranging from .17 to .31 between self-ratings of performance by medical interns and ratings of supervisory physicians, and Strauss (1966) reported a correlation of .39 between self and supervisory ratings of performance for a group of scientists. It is interesting to note that Strauss found a much higher correlation (.68) between the self-rating measure and the scientist's perception of his supervisor's evaluation. He concluded that "this suggests that self-images of productivity [i.e., performance] are formed primarily from perceptions of supervisor ratings . . .

rather than actual supervisor opinions" (p. 473).

There is some evidence that personality characteristics may influence self-ratings of performance as well. In Kegel-Flom's (1975) study of medical interns, their scores on the "dominance" scale of the California Psychological Inventory were positively correlated with self-ratings of performance while scores on the "flexibility" scale were negatively correlated with self-ratings of performance, but both scales were unrelated to supervisory ratings. It would appear that these personality characteristics are unrelated to actual performance, but they contribute to an individual's likelihood of evaluating his own level of performance more favorably. Such personality traits may distinguish those in our study who rated their own performance favorably from those who were more modest in their assessments. If this is the case, it may explain the difference in self-reported performance ratings between men and women, since the feminine social role is traditionally less dominant than the masculine role.

These suggestions deserve further study in order to better understand the discrepancies which exist between self and supervisory ratings of performance. The studies cited above are the only ones in the literature to have examined factors which may account for such discrepancies.

How do our findings concerning the variables with which job performance is correlated compare to those previously reported in the literature? We have found partial support for Holland's (1973) hypothesis and Howell's (1966) empirical finding that interpersonal competence is associated with more effective job performance. Interpersonal competence is correlated moderately (.252) with self-ratings of performance but is unrelated to supervisory ratings. Our findings are also partially consistent with previous findings of negligible correlations between performance during training and later job performance (Peterson et al, 1956; Taylor et al, 1964; Richards et al, 1965; Saffer and Saffer, 1972; Wingard and Williamson, 1973).

In our study, performance in basic science and classroom work during training is not related to any job performance measures. On the other hand, performance in patient care activities during training is moderately correlated (.259) with self-ratings of performance, although not with supervisory ratings. Since our measure of performance during training is based upon self-reports rather than actual grades, a predisposition toward favorable self-evaluations may account for the positive correlation between these two variables. If this is not so, it is possible that physician assistants consider other physician assistants to be the reference group for their performance evaluations, with performance during training thus being viewed as the most valid indicator of their performance relative to other physician assistants.

Another possible explanation for the observed significant relationship between performance during training and job performance is the recency of graduation of the study sample. Over three-quarters graduated two years or less before the data for this study were collected. For this group, the correlation between performance in patient care activities during training and job performance as assessed by self-ratings is .290 while for the group graduating in 1972 or before, the correlation is only .108 (not significant at the .001 level). There is some evidence for physicians that job performance of recent graduates is significantly correlated with performance during training (Peterson et al, 1956; Kegel-Flom, 1975), although, as noted earlier, this is not obtained for those further removed from their training. Our findings may thus be a reflection of this same phenomenon.

Our data do not support those of Thomas (1959) and Revans (1962) that job performance is better in smaller organizations. Physician assistants do not appear to perform more effectively in private solo or group practices than in clinic or hospital settings. We do find, however, as have others (Halpin, 1965; Halpin and Winer, 1957; Likert, 1961), that more effective performance is associated with greater supervisory support. Although it is commonly concluded from such results that more effective performance results from greater supervisory support, alternative interpretations are also conceivable. Physicians, for example, may provide greater supervisory support to those physician assistants thought to be performing more effectively. This may be true particularly when supervising physicians delegate increasing responsibility on the basis of the physician assistant's job performance, since greater responsibility for patient care may require additional supervisory support.

As mentioned earlier, a number of programs have recently begun referring to their graduates as "physician associates", rather than physician assistants. This change in terminology is based in part upon the belief that the graduates of these programs receive training superior to that of other programs. In spite of this and the fact that associate programs attract persons with more extensive prior education, the job performance of graduates of different types of physician assistant programs is essentially identical. Should graduates of associate programs in fact receive superior training (an assumption we cannot test directly), this does not appear to enhance their performance as professionals.

In conclusion, our analysis of the job performance of physician assistants underscores the complexity of the topic. Objective performance criteria are not well developed nor easily employed in large-scale research projects such as ours. Self-ratings of performance appear to be influenced by a number of psychological factors which complicate their interpretation. Finally, although physician ratings appear to be a valid measure of performance, we are unable to isolate any background or work environment variables which have a significant influence upon performance as assessed by supervising physicians.

The only secure findings obtained in this analysis are that job performance is associated with both level of responsibility for patient care and level of physician role support. The interpretation of these relationships remains problematic, however. Although it is possible that greater responsibility and physician role support results in more effective job performance, it is at least equally plausible that responsibility and physician role support are to a large extent influenced by job performance. Our findings are consistent with the hypothesis that expansion of responsibility and increase in physician role support would improve job performance, although the data do not conclusively confirm this hypothesis. This is the only conslusion of practical importance which can be drawn from our investigation of the job performance of physician assistants.

II. Job Satisfaction

A. General Level of Job Satisfaction

Our analysis of job satisfaction is based upon three different measures of job satisfaction: the Hoppock job satisfaction scale, a career satisfaction scale, and job turnover. Since these measures have been used in studies of other occupational groups, we can compare the general level of job satisfaction as determined by these measures to that reported for other occupational groups.

Table 5 describes the general level of job satisfaction as determined by the Hoppock scale for physician assistants and others. The data from Schletzer (1966) and Hoppock (1935) shown in this table are based upon considerably smaller samples than our own and may not be entirely representative of the levels of job satisfaction in each of these other occupations. Hoppock's (1935) data were collected over four decades ago and therefore may not accurately reflect the present levels of job satisfaction in these occupational groups.[2] Even though these data possess limitations, they do provide a meaningful comparison with our own as long as these limitations are kept in mind.

The job satisfaction scores for physician assistants are similar to those reported by Schletzer (1966) for physicians and lawyers. Dentists appear to have somewhat higher levels of job satisfaction than physician assistants, while that for accountants, engineers, and journalists is lower. The level of job satisfaction for physician assistants

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[2] There is no evidence in the literature to suggest that temporal changes in job satisfaction have taken place, however.

Table 5

Job Satisfaction Of Physician Assistants And Other Occupational Groups

	mean scale score	S.D.	N
Physician Assistants	22.57	2.98	939
Professionals[a]			
accountants	21.71	2.42	24
dentists	23.60	2.72	35
physicians	23.11	2.85	28
engineers	20.16	2.50	37
journalists	19.80	3.40	20
lawyers	22.67	2.52	36
New Hope, Pa. Residents[b]			
professional, managerial, and executive personnel	22.40	—	23
subprofessional, business, and minor supervisory personnel	21.92	—	32
skilled manual and white collar	20.40	—	84
semiskilled workers	19.32	—	74
unskilled workers	16.04	—	55

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[a] from Schletzer (1966)

[b] from Hoppock (1935, p.255)

resembles that for professional, managerial, and executive personnel and is slightly higher than that for the subprofessional business and minor supervisory personnel included in Hoppock's study. Physician assistants express considerably higher levels of job satisfaction than blue collar workers (Hoppock, 1935).

The career satisfaction scale included in this study is similar to that developed by Gross, Mason, and McEachern (1958) to assess the career satisfaction of school superintendents. Our findings for physician assistants are compared with theirs in Table 6. For three of the four items shown in this table, physician assistants express considerably higher levels of career satisfaction than do school superintendents.

Data concerning the job turnover of physician assistants are shown in Table 7. Among those who graduated in 1972 or before, over half are still employed in their original positions, and only 10% have held three or more different jobs. For physician assistants who graduated in 1973, three-fourths are still in their original positions. Since most physician assistants are recent graduates, expected length of employment may be a more accurate indicator of job satisfaction than actual job turnover.

Table 6

Career Satisfaction Of Physician Assistants And School Superintendents

	percent of P.A.'s who responded affirmatively (N=939)	percent of superintendents who responded affirmatively to similar question[a] (N=105)
It is one of the most satisfying career one could follow	81.0%	68.6
If I "had it to do over again," I would definitely become a physician assistant	63.2	42.9
My career as a physician assistant has lived up to the expectations I had before entering it	87.1	95.5
If a friend were considering a career in the health field, I would definitely advise him to apply to a physician assistant program	46.1	29.5

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[a] source: Gross, Mason, and McEachern (1958, p.354)

Table 7

Actual And Anticipated Job Turnover Of Physician Assistants

A. Number Of Jobs Held As A Physician Assistant By Year Of Graduation

	Year Of Graduation		
	1967-1972	1973	1974
	(n=208)	(n=274)	(n=440)
0(n=15)	0.5%	1.5	2.3
1(n=722)	55.8	75.5	90.7
2(n=156)	33.7	20.4	6.8
3+(n=29)	10.0	2.6	0.2
	100.0	100.0	100.0

B. Expected Length Of Employment In Present Position	Percent (N=903)
less than 6 months	7.5%
less than 1 year	8.3
a couple of years	23.8
about 5 years	8.4
indefinitely	52.0
	100.0

In Table 7B it can be seen that over half of the study sample expect to remain in their present position indefinitely, while only 15.8% expect to remain for less than one year. These data are in contrast to the 70% average annual job turnover rate reported for staff nurses in American hospitals (National Commission for the Study of Nursing and Nursing Education, 1971).

The above findings thus indicate that the level of job satisfaction of physician assistants is relatively high. The following comments made by two respondents appear to be representative of the sentiments of physician assistants.

> Being a P.A. has given me pride and self-respect and a way to aid my fellow man.
>
> No computer will ever understand the pure joy and thrill of being a P.A.

A number of factors may account for the high level of job satisfaction of physician assistants. In many ways, physician assistants are at the apex of the allied health professions. They generally have greater incomes and greater responsibility for patient care than most other allied health professionals. They are also a relatively elite group as a result of the competition faced in gaining admission into their profession. Dobmyer, Sonderegger, and Lowin (1975) indicate that in 1972 there were approximately 7.9 applications for each available position in a physician assistant program. The pride which results from being associated with a select group may in itself be an important source of job satisfaction.

Finally, there may be a "honeymoon effect" for the profession as a whole arising from the special challenges and rewards of being at the forefront of what many consider to be an exciting new development in the practice of medicine. As one respondent described it,

> I consider myself to be a pioneer. Any pioneer faces things that are frustrating, but there is also the challenge. Not everyone can be a pioneer, for it requires a special individual. Things that are already established offer very little challenge.

Similar sentiments were expressed by a respondent in Breer, Nelson, and Bosson's (1975) study who found "being a pioneer in a new field exciting and satisfying". Having thus considered the general level of job satisfaction of physician assistants, we will next examine the correlates of job satisfaction obtained for the study sample.

B. Relationships Between Job Satisfaction and Other Study Variables

The three measures of job satisfaction included in our analysis are themselves rather highly correlated as shown in Table 8. Tables 9 and 10 describe

Table 8

Intercorrelations Of Work Satisfaction Measures

	job satisfaction	career satisfaction	expected length of employment
job satisfaction	1.000		
career satisfaction	.582 (939)	1.000	
expected length of employment	.480 (904)	.289 (904)	1.000

the relationships between job satisfaction measures and personal, background, work environment, or job characteristics found to be significant at the .001 level or less. Physician role support, perceived career opportunities, and level of responsibility for patient care are more strongly related to job satisfaction measures than are other study variables.

Of the various personal and background characteristics considered, being older, possessing more effective interpersonal competence, greater prior medical experience before becoming a physician assistant, and having been a corpsmen are all related to at least one measure of job satisfaction. These relationships are all rather modest, however, and no correlation exceeds .18.

Work environment characteristics are also rather weakly related to job satisfaction. Physician assistants employed in general primary care fields and in private practice settings expect to remain in their present positions somewhat longer than others. Those working in smaller communities also expect to remain in their present positions longer and express higher levels of job satisfaction. None of the work environment characteristics, however, are significantly related to all three

Table 9

Relationships Of Work Satisfaction Measures With Personal Background And Work Environment Characteristics

A. Job Satisfaction By Medical Background

	corpsman	other medical field	none
	(n=513)	(n=216)	(n=210)
job satisfaction	22.95 (s.d.=2.78)	22.39 (s.d.=2.78)	21.84 (s.d.=3.50)

B. Expected Length Of Employment In Present Job By Medical Background

	corpsman	other medical field	none
	(n=497)	(n=206)	(n=201)
expected length of employment	4.04 (s.d.=1.27)	3.85 (s.d.=1.33)	3.57 (s.d.=1.40)

Table 9 (continued)

C. Expected Length Of Employment In Present Job By Specialty

	general primary care	specialty primary care	surgery	other specialties
	(n=377)	(n=254)	(n=163)	(n=78)
expected length of employment	4.13 (s.d.=1.88)	3.69 (s.d.=1.34)	3.82 (s.d.=1.44)	3.77 (s.d.=1.40)

D. Expected Length Of Employment In Present Job By Practice Setting

	private solo	private group	clinic	hospital	clinic and hospital
	(n=175)	(n=245)	(n=186)	(n=96)	(n=145)
expected length of employment	4.15 (s.d.=1.37)	4.21 (s.d.=1.23)	3.63 (s.d.=1.26)	3.60 (s.d.=1.39)	3.76 (s.d.=1.22)

Table 10

Correlations Of Work Satisfaction Measures With Personal, Background, Work Environment, And Job Characteristics

	age	inter comp	no. yrs exp	comm size	lev resp	MD role sup
Job Satisfaction	.158 (936)	n.s.	.175 (939)	-.146 (918)	.343 (939)	.505 (939)
Career Satisfaction	.127 (936)	.106 (939)	.110 (939)	n.s.	.310 (939)	.372 (939)
Expected length of employment	.169 (901)	n.s.	.120 (904)	-.141 (887)	.188 (904)	.337 (904)

Table 10 (continued)

Correlations Of Work Satisfaction Measures With Personal, Background, Work Environment, And Job Characteristics

	nurse accep	patient accep	income	prestige	job opp	car opp
Job Satisfaction	.196 (939)	.178 (705)	.159 (911)	.235 (868)	.227 (913)	.343 (928)
Career Satisfaction	.164 (939)	.201 (705)	.130 (911)	.246 (868)	.264 (913)	.292 (928)
Expected length of employment	.141 (904)	n.s.	.121 (881)	.150 (837)	n.s.	.275 (899)

job satisfaction measures. Thus, the overall contribution of personal, background, and work environment characteristics to job satisfaction appears to be small even though a number of significant relationships between those variables have been identified.

The only variables included in our analysis which were not found to be related to any job satisfaction measure are the following:

(a) sex
(b) number of years of education before beginning physician assistant training
(c) type of physician assistant program attended
(d) performance during physician assistant training
(e) year of graduation
(f) military versus civilian employment.

Those variables most strongly related to job satisfaction, as we have already mentioned, are level of physician role support, perceived level of career opportunities, and level of responsibility for patient care. Eight of the nine correlations between these variables and job satisfaction measures are .27 or greater while all of the other correlations in Table 10 are below this level. Additionally, however, nurse acceptance, patient acceptance, income, perceived occupational prestige, and perceived job opportunities appear to contribute significantly to job satisfaction although these relationships are not as strong.

The first major conclusion to be drawn from these results is that the quality of the physician assistant's relationship with his supervising physician is the most important determinant of job satisfaction. The level of physician role support has a greater influence upon the job satisfaction of physician assistants than any other variable included in this study. The second major conclusion is that opportunities for career advancement and responsibility for patient care also have important consequences for the job satisfaction of physician assistants.

How do our findings compare with those previously reported in the literature? Several studies report significant correlations between supervisory support and job satisfaction. Halpin and Winer (1957) and Halpin (1957) have each obtained correlations of at least .60 between supervisory support and job satisfaction. Other researchers reporting significant relationships between these variables are Fleishman, Harris, and Burtt (1955), Seeman (1957), and Likert (1961, 1967).

Vroom (1964, pp. 111-112), however, cautions that a positive correlation between supervisory support and job satisfaction is not conclusive evidence that the former affects the latter since it is possible that the level of supervisory support is influenced by one's level of job satisfaction. Furthermore, Vroom argues, when the measure of supervisory support is based upon the subordinate's evaluation (as ours is), his level of job satisfaction may influence this evaluation. While neither of these concerns can be dismissed, our data do not allow one to distinguish between these possibilities and the interpretation that high levels of supervisory support contribute to employee satisfaction. Clearly, this is an area which deserves additional investigation.

Level of responsibility has been reported in previous research to be associated with job satisfaction for a number of occupational groups (Morse and Reimer, 1956; Ross and Zander, 1957; Ford, 1969), including physician assistants (Breytspraak and Pondy, 1969; Engel and Shulman, 1975). Unlike the research concerned with the relationship between support and job satisfaction, the evidence is rather persuasive that responsibility contributes to satisfaction rather than the reverse. Both Morse and Reimer (1956) and Ford (1969) observed increments in job satisfaction following the expansion of job responsibilities for samples of white collar workers in large business organizations.

Our findings are also in agreement with those of Van Zelst (1951) who reported a substantial correlation between levels of acceptance by coworkers and job satisfaction. We have found physician, nurse, and patient acceptance all to be significantly related to job satisfaction.[3]

Of the remaining job characteristics correlated with job satisfaction, only job opportunities have not previously been suggested in the vocational psychology literature as a significant determinant of job satisfaction. Career advancement opportunities (Sirota, 1959), income (Centers and Cantril, 1946; Lawler and Porter, 1963; Kalleberg, 1974), and occupational prestige (Hoppock, 1935; Centers, 1948; Porter, 1962; Kalleberg, 1974) have all been found to be related to job satisfaction.

The only work environment characteristic consistently reported to be associated with job satisfaction is organizational size. Those working in smaller organizations report greater levels of job satisfaction (Porter and Lawler, 1965). Our findings provide only slight support for this hypothesis. Only one of the three measures of job satisfaction, expected length of employment, is significantly greater for those employed in private practice settings compared to those in clinic and hospital settings. Private practices are in almost all cases smaller organizations than are clinics or hospitals. Finally, the only personal or background characteristic consistently reported to be associated with job satisfaction is age (Hoppock, 1935; Bernberg, 1954; Herzberg et al, 1957; Crozier, 1971; Van Maanen and Lawrence, 1965; Crozier, 1971; Van Maanen and Katz, 1975). We, too, have obtained a significant positive relationship between these two variables.

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[3] Our measure of physician acceptance, as mentioned earlier, has been incorporated into the physician role support scale.

As the above discussion demonstrates, most of our findings regarding the job satisfaction of physician assistants correspond to those reported for other occupational groups. One additional characteristic peculiar to the physician assistant profession which we have found to be related to job satisfaction is one's medical experience prior to beginning physician assistant training. Those with more prior experience also report greater job satisfaction. The effect of past medical experience upon job satisfaction may perhaps be mediated by other variables such as level of responsibility, physician role support, or job opportunities. These variables are all related to past medical experience and may affect job satisfaction more directly. This possibility will be considered in the following chapter. It is also possible that more extended work in the health field before becoming a physician assistant enhances one's appreciation of the significant differentials in status among health occupations, thereby resulting in greater satisfaction with one's current attainments. Still another explanation may be that those with prior experience have achieved significant upward mobility during their careers while those with no prior experience have not. Thus the extent of upward mobility may be one factor accounting for the difference in levels of job satisfaction between these two groups.

Although we have found the majority of study variables to influence the job satisfaction of physician assistants, only three of these variables have a substantial influence: physician role support, perceived opportunities for career advancement, and level of responsibility for patient care. A favorable working relationship with one's supervising physician appears to be critically important for the physician assistant's job satisfaction since the two work closely together and the supervising physician generally directs the physician assistant's professional activities. Perceiving a future of open opportunities for advancement in one's career appears to be an important source of job satisfaction as well. Anticipating both the intrinsic and the extrinsic rewards which such opportunities furnish affects satisfaction with one's current job. Finally, performing an influential role in the care of patients has an important effect upon the job satisfaction of physician assistants.

There may be a number of explanations for this latter phenomenon. First of all, making decisions which result in the improvement of a patients' health is a highly satisfying experience. Second, greater responsibility produces a more favorable self-image and greater status in the eyes of coworkers and patients. Third, greater responsibility is generally challenging and stimulating. Finally, greater responsibility may be more congruent with the role expectations which the physician assistant developed during his training. Thus, for these reasons, it is not surprising that level of responsibility for patient care is an important source of job satisfaction for physician assistants.

C. Relationships Between Job Performance and Job Satisfaction

Thus far we have discussed only those personal, background, work environment, and job characteristics which are related to job satisfaction. The possibility that job satisfaction and job performance might themselves be related has not yet been considered. Table 11 presents the correlations between performance and satisfaction measures. Seven of the nine correlations are statistically significant and the correlations of the self-rating performance measure with both job and career satisfaction are both rather sizeable (.342 and .337 respectively). The correlations between physician performance ratings and satisfaction measures are more modest, being .21 or less.

Our findings indicate that a positive, though not substantial, correlation exists between performance and satisfaction. This in agreement with Vroom's (1964, p. 183) review of studies in which this relationship was assessed. For the twenty studies included in his review the median correlation between performance and satisfaction was found to be .14.

The interpretation of this relationship, unfortunately, is not straightforward since it is plausible that each variable in the

Table 11

Relationships Between Work Satisfaction And Job Performance Measures

	self-rating of job performance	supervising M.D.'s rating of job performance	supervising M.D.'s level of satisfaction with P.A.'s work
job satisfaction	.342 (939)	.177 (654)	.215 (662)
career satisfaction	.337 (939)	.128 (654)	.156 (662)
expected length of employment	.127 (904)	n.s.	n.s.

relationship could influence the other.
We think it likely, in the case of the physician assistant, however, that performance has a greater effect upon satisfaction than vice versa. Effective performance is likely to improve various aspects of the physician assistant's job situation, such as level of responsibility, role acceptance, income, job and career opportunities, all of which are significant determinants of job satisfaction. While it is conceivable that a low level of job satisfaction would lead a physician assistant to perform less effectively, we think this is less likely. Support for this position is provided by others (Brayfield and Crockett, 1951; Vroom, 1964, p. 187; Porter and Lawler, 1968; and Locke, 1970).

We suspect also that self-perceptions of performance have a direct influence upon job satisfaction which is independant of the effect of performance upon satisfaction mediated by job characteristics. Feeling that one is performing an effective job is intrinsically satisfying. The greater correlation with satisfaction measures observed for self-ratings than for physician ratings of performance is consistent with this line of reasoning.

III. Summary

In this chapter, the general levels of job performance and job satisfaction of physician assistants have been assessed as well as the correlates of these variables. The general level of performance of physician assistants according to evaluations of their supervising physicians is quite high. In general, supervising physicians appear to be pleased with the work of the physician assistant.

We have been unable to identify any variables which have a definite influence upon the job performance of physician assistants. Only two variables were significantly related to all of the job performance measures included in our study: level of physician role support and level of responsibility for patient care. These characteristics may be in large part determined by one's job performance, rather than the reverse. Thus the extent to which these variables influence one's job performance is uncertain.

Self-ratings of job performance differ substantially from ratings provided by supervising physicians. We suspect that self-ratings may be biased in several ways while physician ratings are probably more valid as measures of actual performance. In particular, it appears that a respondent's confidence in his own ability, the favorableness of his self-concept, and the actual characteristics of his job have an effect upon his own performance rating. Such conclusions are tentative, however, and deserve further verification. Additional research concerned with understanding discrepancies between supervisor and employee job performance ratings would be useful in the interpretation of our results.

What, then, have we learned about the job performance of physician assistants? The general level of performance is favorable, to be sure. None of those personal and background characteristics (including performance during physician assistant training) which have been included in our study consistently predict performance as determined by both self and physician ratings. Furthermore, neither do any of the work environment characteristics we have assessed appear to influence job performance.

To obtain a better understanding of the influences upon the job performance of physician assistants, additional variables will have to be investigated. Perhaps an objective measure of performance should be devised, and more elaborate measures of the physician assistant's personality and aptitude as well as more detailed information about the work environment would have to be included in the analysis.

The major conclusion provided by our analysis is that physician role support and level of responsibility for patient care possibly influence job performance. Our data do not conclusively demonstrate this, however. They are only consistent with this possibility, which is nevertheless a plausible one. No matter how capable and well-trained a physician assistant may be, he will be able to accomplish little in his professional role without the support, guidance, and cooperation of his supervising physician. In addition, a certain level of responsibility for patient care may be necessary to provide sufficient challenge and stimulation for the physician assistant to enable him to perform optimally. Thus it may be the case that the delegation of additional authority may enhance one's performance because of the greater challenge which accompanies this change.

Our analysis of the job satisfaction of physician assistants indicates that the overall level of satisfaction is quite high in comparison to that for other occupational groups. Physician assistants express levels of job satisfaction similar to that reported for other professionals. Although a host of variables have been found to be weakly related to job satisfaction measures, only three evidence substantial relationships. These are physician role support, perceived level of career opportunities in one's present position, and level of responsibility for patient care.

In view of the close working relationship which generally exists between the physician assistant and the supervising physician, it is not surprising that the quality of this relationship, as determined by the respondent's evaluation of the role support provided by his supervising physician, has a powerful influence upon the physician assistant's job satisfaction. A favorable perception of opportunities for career advancement in one's present position contributes rather substantially to job satisfaction as well. Thus the quality of anticipated job characteristics in the future appear to contribute to one's present state of job satisfaction. Finally, the extent of one's responsibility for patient care influences job satisfaction, most likely because of the greater intrinsic satisfactions derived from contributing to the care of patients and the greater challenges which accompany an increase in responsibility for patient care.

Our analysis thus far has been concerned with simple frequency distributions of study variables and bivariate relationships. In the following chapter, we will use a multivariate analytic technique to reassess the relationships between study variables. This procedure will confirm a number of our earlier conclusions and will provide additional insights into the physician assistant profession not obtainable with the analyses presented thus far.

CHAPTER V

PATH ANALYSES OF THE GENERAL CHARACTERISTICS, JOB PERFORMANCE, AND JOB SATISFACTION OF PHYSICIAN ASSISTANTS

I. Introduction

This chapter presents the findings obtained by incorporating the study variables into causal models and assessing the resulting multivariate relationships by means of path analysis. This procedure has a number of advantages compared to the bivariate analyses which have been presented so far. First of all, it allows one to assess the influence of a given independent variable upon a dependent variable after controlling for the influence of other independent variables. Second, path analysis provides a means of identifying the process by which influences are transmitted. That is, it allows one to assess the extent to which intervening variables mediate the influence between a given independent and dependent variable. Thus, influences can be partitioned into direct (i.e., unmediated) and indirect effects. Third, path analysis permits comparisons between influences of independent variables upon a given dependent variable by simply assessing the relative magnitude of the appropriate path coefficients. This has not been possible so far because bivariate relationships are not always evaluated with the same statistical technique. In some situations, correlation coefficients have been used while in others cross tabulations or analysis of variance procedures have been required to describe bivariate relationships.

For these reasons, path analysis provides a considerable amount of additional information concerning the relationships between variables which is not obtainable with bivariate analyses. Path analysis also allows us to test the robustness of bivariate relationships under more rigorous conditions by controlling for the effects of other independent variables. Even though many findings in this chapter will be similar to those previously discussed, their meaning will not be precisely the same because of the different analytic technique used.

We have adopted an abbreviated format for describing the causal models upon which the path analyses in this chapter are based. A full representation of models of the complexity of ours would be impractical because of the relatively large number of variables employed. Figures 1 and 2 present a hypothetical causal model which has been diagrammed in a complete and also in an abbreviated format. Each prior variable is assumed to potentially influence each subsequent variable in the model. The model also allows for correlation between exogenous variables (A,B, & C) and also

Figure 1

A Completely Described Hypothetical Causal Model

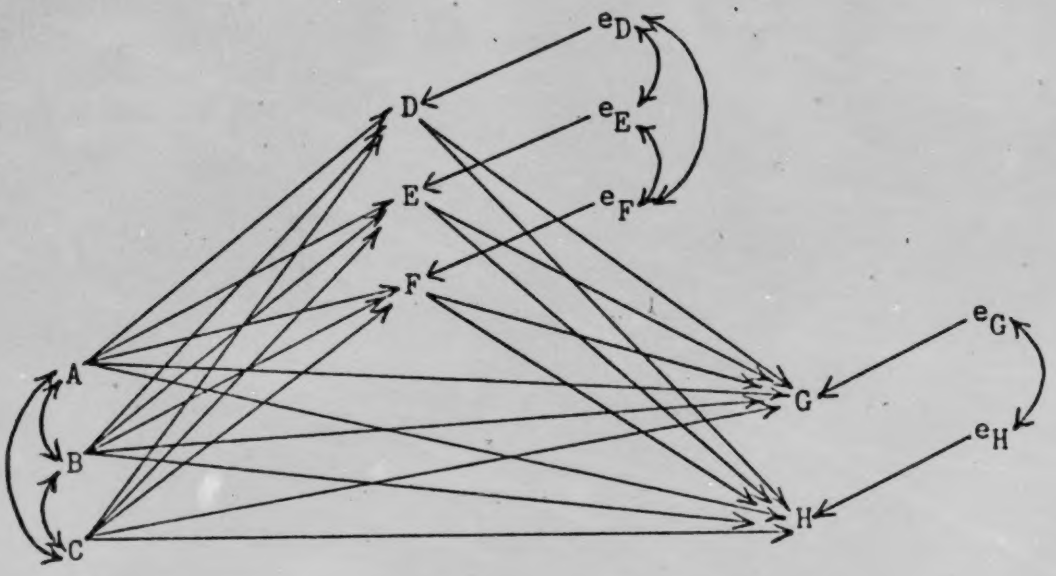
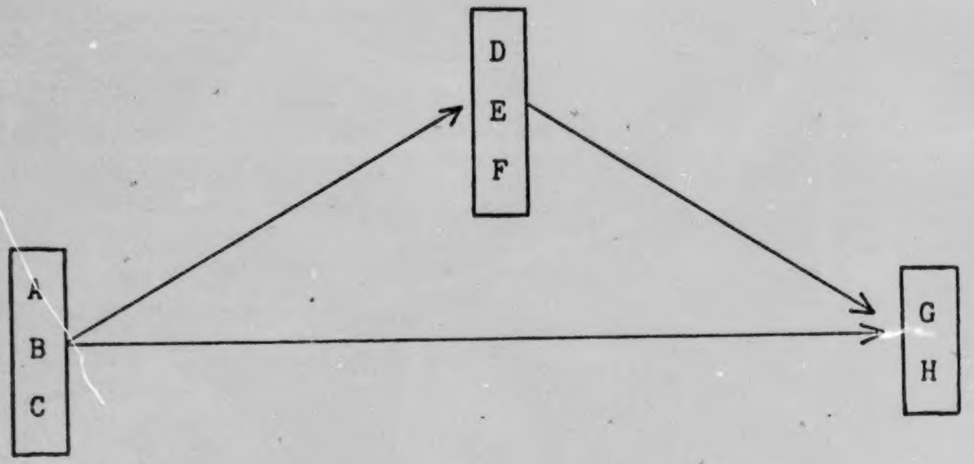

e_D
D
e_E
E
e_F
F
e_G
A
G
B
e_H
H
C

Figure 2

An Abbreviated Description of the Causal Model Shown in Figure 1



between the error terms of dependent variables at the same stage of the model (e_D, e_E, and e_F as well as e_G and e_H). The arrows which have been omitted from the abbreviated diagram in Figure 2 are all assumed to be present. Thus, the abbreviated diagram is structurally identical to that shown in Figure 1. All of the causal models which we will discuss will be described by this abbreviated format.

Several variables have been omitted from the path analyses. "Patient acceptance" has been excluded because of the large number of cases with missing information for this variable. The variable "military versus civilian employment" was excluded as well because of its redundancy with type of physician assistant program attended. Almost all military physician assistants attended programs sponsored by the military.

The Hoppock scale is the only measure of job satisfaction included in the analysis.[1] Both the self-rating and the physician rating of job performance have been retained, however.[2] Each causal model which includes job performance will be analyzed in two different ways. The self-rating measure of performance will be employed in one analysis and the physician rating of performance in another. Each of the variables included in the analysis will be referred to in the diagrams and figures by abbreviations. These abbreviations are shown and described in Table 1.

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[1] This scale could have been combined with the career satisfaction scale and expected length of employment to produce a more reliable single indicator of job satisfaction. Because of the high reliability of the Hoppock scale (coefficient alpha=.825) to begin with, this procedure does not appear to be necessary.

Because our previous analyses have shown only minor differences between some of the categories for the "specialty" and "practice setting" variables, these categories have been combined. In particular, we have combined "surgery" and "other specialties" into a single category. In the path analyses which follow, "specialty" consists of three rather than four categories: general primary care, specialty primary care, and other specialties. The "practice setting" variable has been reduced from five to two categories: private practice versus institutional practice. The private practice category includes all those in private solo or private group practices while the institutional practice

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[2] The physician's satisfaction with the performance of the physician assistant has not been included in this analysis. This measure could have been combined with the physician's performance rating, but again the high reliability of the latter (coefficient alpha=.782) suggests that it is an adequate measure by itself.

Table 1

Description of Variables Included in the Path Analyses

Personal and Background Characteristics

AGE
SEX (male = 1, female = 0)
INTER COMP, interpersonal competence
NO YRS ED, number of years of post-high school education before beginning physician assistant training
NO YRS EXP, number of years of medical experience before beginning physician assistant training
PRGM 1, type of physician assistant program attended (graduates of associate programs = 1, others = 0)
PRGM 2, type of physician assistant program attended (graduates of MEDEX programs = 1, others = 0)
PRGM 3, type of physician assistant program attended (graduates of military programs = 1, others = 0)
ACAD PERF, performance in basic science and classroom work during physician assistant training
PT PERF, performance in patient care activities during physician assistant training
YR GRAD, year of graduation from physician assistant training

Work Environment Characteristics

SPCLTY 1, specialty (general primary care = 1, others = 0)
SPCLTY 2, specialty (specialty primary care = 1, others = 0)
PRACTICE, type of practice setting (institutional practice = 1, private practice = 0)
SIZE COMM, community size

Job Characteristics

LEV RESP, level of responsibility for patient care
MD ROLE SUP, physician role support
RN ACCEP, nurse acceptance
INCOME
PRESTIGE, perceived occupational prestige
JOB OPP, perceived job opportunities
CAR OPP, perceived opportunities for career advancement in the present job

Performance and Satisfaction

JOB PERF, job performance
JOB SAT, job satisfaction

category includes all those working exclusively in clinic or hospital settings. The dummy variable procedure for including these nominal variables, as well as type of program attended and sex, in the analysis has been described in Chapter II.

It should be recalled from our discussion of path analysis in Chapter II that those respondents with missing information for any variable included in the analysis have been deleted from the analysis. For the most part, the analyses are based on 697 cases. Because information from supervising physicians was obtained for only approximately two-thirds of the original sample, the analyses of physician ratings of performance are based on only 506 cases. As was shown in Table 2 of Chapter II, these sub-samples are quite similar to the total study sample. Finally, those correlations involving variables for which an estimate of scale reliability is available have been corrected for attenuation as described in Chapter II.

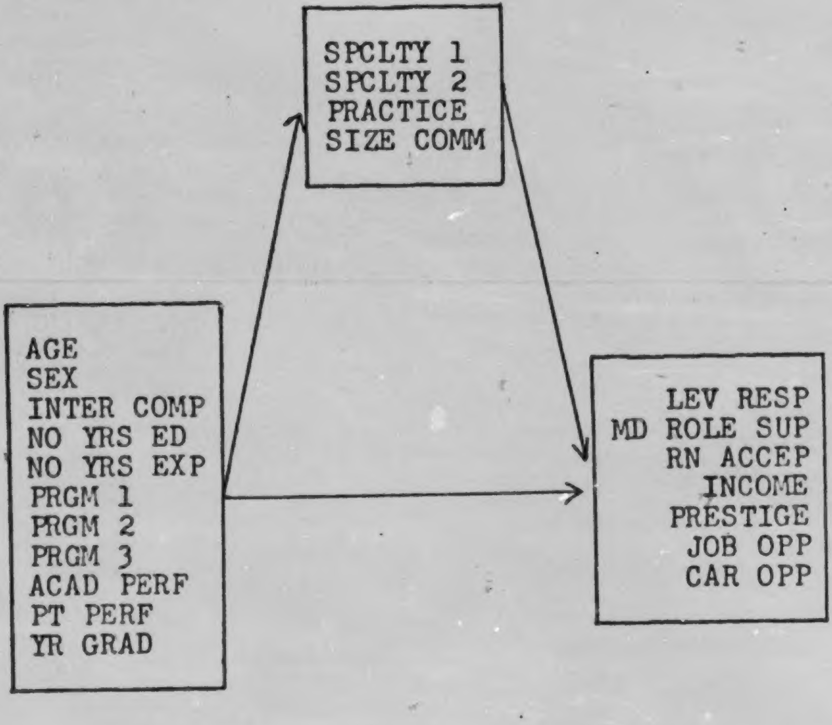
II. Causal Relationships Among Personal, Background, Work Environment, and Job Characteristics

The causal model which has been developed to describe the relationships between personal, background, work environment, and job characteristics is shown in Figure 3. Personal and background characteristics are assumed to influence the choice of work environments. One's job characteristics, on the other hand, are assumed to be influenced by one's personal and background characteristics as well as by the work environment in which one is located. In essence, the model states that a physician assistant's personal and background characteristics affect his choice of work environments and that these variables together affect the characteristics of his job.

This model has ignored a number of possible causal relations between variables within the same groups. For instance, personal characteristics (age, sex, and interpersonal competence) as well as number of years of education and number of years of previous medical experience could be considered to be causally prior to training variables (PRGM 1,2, and 3, ACAD PERF, PT PERF, and YR GRAD). Or, it might be hypothesized that perceived occupational prestige is influenced by level of responsibility for patient care and income. The causal relationships between variables within the same groups are of secondary interest, however. Therefore we have chosen not to consider these relationships in our analysis.

Figure 3

A Causal Model of Personal, Background, Work Environment, and Job Characteristics


SPCLTY 1
SPCLTY 2
PRACTICE
SIZE COMM
AGE
SEX
INTER COMP
NO YRS ED
NO YRS EXP
PRGM 1
PRGM 2
PRGM 3
ACAD PERF
PT PERF
YR GRAD
LEV RESP
MD ROLE SUP
RN ACCEP
INCOME
PRESTIGE
JOB OPP
CAR OPP

A. Influences Upon Choice of Work Environment Characteristics

The estimated parameters for the model linking personal, background, work environment, and job characteristics diagrammed in Figure 3 are presented in Table 2.[3] The major influences upon specialty choice are sex and type of physician assistant program attended. Women are more likely to choose a specialty primary care field (SPCLTY 2),[4] while graduates of MEDEX programs (PRGM 2) are more likely to be employed in a general primary care field (SPCLTY 1).[5] None of the other personal and background characteristics substantially affect specialty choice. In fact, the modest R^2 for these two specialty variables indicates that personal and background variables are not especially influential in channeling physician assistants into particular specialties following graduation.

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[3] The path coefficients for JOB PERF and JOB SAT in the last two columns of this table refer to a different causal model which will be discussed later.

[4] Specialty primary care refers to general internal medicine, pediatrics, and obstetrics and gynecology. Almost all of the physician assistants in this specialty area are in general internal medicine.

[5] General primary care refers to either family or general practice.

Table 2

Significant (p< .001) Standardized Path Coefficients for Causal Models in Figures 3, 5, 6, and 8 Using the Self-Rating Measure of Job Performance (N=697)

	SPCLTY 1	SPCLTY 2	PRACTICE	SIZE COMM	LEV RESP	MD ROLE SUP	RN ACCEP	INCOME	PRESTIGE	JOB OPP	CAR OPP	JOB PER	JOB SAT
AGE	.086				.037				.031			.063	.078
SEX		-.167		-.129			.089	.177		.168		.231	.050
INTER COMP				.163	.241	.116		.143	.113	.147	.245	.333	
NO YRS ED		-.092						.070					-.048
NO YRS EXP													.081
PRGM 1					.141		.104	.127	.092	.155			
PRGM 2	.210		-.101	-.175	.071			-.100			-.091		.071
PRGM 3	.109	.080	.348		.147			-.167	-.093	.110	-.178		
ACAD PERF			-.068				.085	.079				.083	
PT PERF	-.075				.124							.133	
YR GRAD							-.074	-.220	-.082	-.100	.083		.064
SPCLTY 1					.255	.104		.105	.099				
SPCLTY 2					.175							-.050	
PRACTICE					.222							-.191	-.122
SIZE COMM					-.188	-.148		-.075	-.135	-.077	-.086	.063	
LEV RESP												.471	.244
MD ROLE SUP												.112	.408
RN ACCEP													.050
INCOME													
PRESTIGE													.036
JOB OPP												.084	.073
CAR OPP													.151
R^2	.089	.052	.135	.092	.277	.051	.050	.211	.088	.120	.095	.705	.542

The major influence upon practice setting is that graduates of military physician assistant programs (PRGM 3) are much more likely than others to be working in institutional settings. This is to be expected since almost all military graduates are still employed in the military and all military practice settings are "institutional" rather than "private". MEDEX graduates are somewhat more likely than others to be working in private practices than in institutional settings.

The final work environment characteristic, community size, is influenced by sex, interpersonal competence, and graduation from a MEDEX physician assistant program (PRGM 2). Women are more likely to locate in larger communities as are those who rate their interpersonal competence more favorably. MEDEX graduates, on the other hand, are more likely to locate in smaller communities even when other personal and background characteristics have been controlled.

These findings are similar to those implied by the bivariate analyses reported in Chapter III. In view of the rather extensive set of personal and background characteristics controlled in this inquiry, we feel reasonably confident in concluding that MEDEX graduates are more likely than other civilian graduates to locate in smaller communities and to be involved in the provision of primary care, and that women physician assistants are less likely to locate in smaller communities.

MEDEX programs appear to be the most successful type of civilian physician assistant program in achieving the policy goals of improving the geographic and specialty maldistribution of medical manpower. As we demonstrated in Chapter III, smaller communities possess fewer physicians per capita than larger communities. Those specialties in greatest need of additional manpower are the primary care specialties. MEDEX programs are more likely to produce graduates who work in smaller communities and in primary care fields than other civilian programs. A number of characteristics of MEDEX programs distinguish them from other civilian programs, but perhaps the most significant is that these programs actively search for employment opportunities for their graduates in areas of medical need. Perhaps other civilian programs could achieve similar results by actively seeking employment opportunities in areas of medical need and encouraging their graduates to choose this type of employment.

The preference by women physician assistants for employment in larger communities may be due to their desire for jobs which do not require evening and weekend work, and to family ties which constrain their geographic mobility. As we found in Chapter III, jobs in smaller communities require longer hours. In addition, women may locate in larger communities becuase this is where their husbands are able to find suitable employment. The effect of sex upon geographic location is not marked, however, and probably would not justify the preferential selection of male applicants to physician assistant programs.

B. Influences Upon Job Characteristics

1. Level of Responsibility for Patient Care

Level of responsibility for patient care is most strongly affected by interpersonal competence, specialty, and practice setting. Physician assistants who rate their interpersonal competence more favorably, those in general primary care specialties, and those employed in institutional settings report greater responsibility for patient care. Somewhat smaller, though still significant, effects are obtained for type of program attended, performance in patient care activities, specialty primary care fields, and community size. Graduates of associate and military programs (PRGM 1 and PRGM 3) report more responsibility for patient care than do either

MEDEX graduates (PRGM 2) or graduates of assistant programs (the suppressed program category).[6] Greater interpersonal competence and more effective performance in patient care activities during training lead to greater responsibility for patient care while employment in surgery and subspecialties (the residual specialty category) is associated with less responsibility.[7] Finally, physician assistants in smaller communities report somewhat greater responsibility for patient care.[8]

These findings concerning level of responsibility for patient care are by and large similar to those obtained in the bivariate analyses. Two findings, however, were not reproduced. A significant zero order relationship between number of years of prior medical experience and level of responsibility exists apparently because of their association with the likelihood of military employment. That is, more experienced physician assistants are more likely to have attended a military physician assistant program and to be employed in the military. Therefore, the direct effect in the path analysis of prior experience upon level of responsibility after controlling for military employment is negligible.

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[6] Since the path coefficients between PRGM 1, PRGM 2, PRGM 3 and level of responsibility are all significant and positive, the suppressed category (graduating from an assistant program) has an implied negative influence upon level of responsibility.

[7] This conclusion is based on the fact that SPCLTY 1 (general primary care) and SPCLTY 2 (specialty primary care) both have significant positive influences upon level of responsibility.

[8] The extent to which work environment characteristics mediate the influence of personal and background characteristics upon level of responsibility and other job characteristics will be discussed shortly.

A significant negative zero order relationship between year of graduation and level of responsibility exists apparently because of their association with age and type of program attended. Older physician assistants as well as graduates of associate programs report more responsibility. These respondents were more likely to have completed their training earlier than others. Consequently, in the path analysis in which these effects are controlled, graduating earlier from a physician assistant program does not lead to greater responsibility for patient care.

Physician assistants working in clinic settings typically have more responsibility than those working in private practice settings probably because clinic physicians feel less need to be closely involved in the care of patients seen in these settings.[9] Clinic patients usually have low incomes and frequently do not have an established relationship with a physician as do private patients, partly because clinic physicians (such as those in residency programs) are employed for relatively short periods of time. The volume of patients seen in many clinics makes the delegation of substantial amounts of responsibility for patient care a necessity. Thus, not infrequently, physician assistants working in clinic settings work relatively autonomously, seeing patients on their own and consulting physicians at their discretion. In private practices, on the other hand, patients are more likely to be seen by a physician and the success of the practice is to a greater extent dependent upon fulfilling the expectations of patients than in clinic settings where patients frequently have no readily available alternative source of medical care. These circumstances may account for the greater responsibility reported by physician assistants working in clinic settings.

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[9] Our interpretation here is focused upon differences in responsibility between those working in clinic settings and those in private practices since our results in Chapter III indicate that those working exclusively in hospital settings possess levels of responsibility similar to those in private practices.

The differences in level of responsibility for those in different specialties probably arise from somewhat different considerations. Those in general primary care fields (i.e., family or general practice) are located in smaller communities where physician shortages are greater. Thus the greater responsibility held by these physician assistants likely derives from the demands upon the supervising physicians in these settings. They may have no alternative but to delegate greater responsibility to their physician assistants. The lesser responsibility reported by those in the "other specialties" category is due principally to the more limited responsibility of those in surgical fields. This is to be expected since assisting in surgery and caring for preoperative and post-operative patients requires much closer supervision than does the diagnosis and treatment of common, less serious problems of ambulatory patients by those in primary care fields.

The greater responsibility held by those employed in the military reflects in part their greater likelihood of employment in clinic settings and in general primary care. But even in addition to these differences in practice setting and specialty, military physician assistants still report greater responsibility than do others. The military, of course, has a long standing tradition of delegating substantial amounts of responsibility for patient care to non-physician personnel. Thus it is not surprising that military physician assistants possess more responsibility than their civilian counterparts.

Among civilian physician assistants, on the other hand, graduates of associate programs report the most responsibility while graduates of assistant programs report the least. These differences are not marked, however. The greater responsibility of associate graduates probably reflects their somewhat more academically oriented training. One of its purposes is to prepare one for more independent functioning in the provision of patient care. As we will discuss shortly, there are sizeable indirect effects of type of program attended upon level of responsibility as well. That is, graduates of particular programs possess more responsibility in part because of the work environments in which they locate.

2. Physician Role Support

The influences upon physician role support are few in number and modest in magnitude. The largest path coefficient is obtained for community size, implying that physician assistants in smaller communities experience greater role support from their supervising physician. More effective interpersonal competence and employment in general primary care fields results in greater physician role support as well.

These findings are rather different from those obtained in Chapter III. In fact, we found no significant bivariate relationship between personal, background, or work environment characteristics and physician role support. Therefore, the findings obtained with path analysis provide some useful insights into physician role support even though the causal relationships themselves are quite modest.

Physician assistants working in smaller communities and in general primary care specialties report slightly more favorable physician role support possibly because their supervising physicians are in greater need of assistance than other physicians. Family or general practitioners in smaller communities frequently work longer hours and see more patients than other physicians. Thus, the employment of a physician assistant may be of greater benefit to them and, as a consequence, more favorable working relationships may exist between them and their physician assistant.

3. Nurse Acceptance

One can see in Table 2 that several personal, background, and work environment characteristics affect nurse acceptance, but again only modestly. The greatest influence upon nurse acceptance is attending an associate program (PRGM 1). Graduates of associate programs report more favorable nurse acceptance than other physician assistants. In addition, being a male physician assistant, performing more effectively in basic science and classroom work, and having greater experience as a physician assistant results in slightly greater nurse acceptance.

These findings provide insights into nurse acceptance which were not revealed in the bivariate analyses. Although we did find earlier that associate graduates encounter fewer problems in nurse acceptance, the other results were not previously obtained. The positive effect of attending an associate program upon nurse acceptance together with the positive effect of academic performance during training suggest that one's general knowledge of clinical medicine may be a significant determinant of nurse acceptance. Associate programs provide more in-depth exposure to the scientific basis of clinical medicine. Thus one might expect that associate graduates as well as those who performed better in basic science and classroom work during training have more extensive knowledge of medicine than others. We suspect that nurses consider these physician assistants to be more deserving of the levels of responsibility and income which they possess and consequently are more accepting of these physician assistants.

This same explanation may account for the slightly greater nurse acceptance reported by those respondents who have had more experience as physician assistants. That is, those with more experience as physician assistants have had more opportunity to expand their clinical knowledge. An alternative interpretation, however, is offered by Breer, Nelson, and Bosson (1975) who found that physician assistants not uncommonly encountered problems in nurse acceptance at the outset of their employment. These problems, which were usually self-limited, were attributed to the nurses' anxiety and uncertainty about potential changes in their own role and status as a result of the introduction of the physician assistant into the practice setting.

Although the physician assistants' sex is only modestly relevant to nurse acceptance, it is nevertheless interesting that women physician assistants encounter slightly greater problems in nurse acceptance than do men. Several explanations of this finding are possible. Perhaps nurses consider the physician assistant's greater responsibility for patient care (relative to their own) as more appropriate for men. Alternatively, nurses may consider women physician assistants to be somewhat "odd" since they are in a predominately male profession. An additional possibility is that nurses identify more closely with women physician assistants and are therefore more envious of their greater responsibility, status, and income than are those nurses working with men physician assistants.

4. Income

The next dependent variable in our causal model is income.[10] The major determinant of income, controlling for all other independent variables in the model, is year of graduation. Income increases with more experience as a physician assistant. Sex has the next greatest influence upon income. Even with all of the other personal, background, and work environment characteristics taken into account, men still are somewhat more highly paid. The unstandardized path coefficient for the causal relationship between sex and income is $1,844, meaning that men earn this much more per year than women after controlling for the other independent variables in the model. Controlling for number of hours worked per week (not shown in Table 2) does not appreciably diminish this sex difference as might have been anticipated. The sex parameter for income when number of hours worked per week is added to the analysis is reduced only slightly from .177 to .155. We have not, however, performed this analysis under the assumption of time and one-half pay for evening and weekend work.

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[10] Income, as we use it here, refers to actual earnings from work performed as a physician assistant rather than total yearly income which would include income from other sources as well.

Other determinants of income include type of physician assistant program attended, interpersonal competence, and specialty. Graduates of associate programs report greater incomes and graduates of MEDEX and military programs report lower incomes than graduates of assistant programs. The unstandardized path coefficient indicates that, after controlling for all other independent variables in the model, graduates of associate programs earn $1,059 more than other physician assistants while MEDEX and military graduates earn $945 and

$1,978 less, respectively, than others.[11] Employment in a general primary care field is associated with an income of $808 more per year than employment in other specialties. Including number of hours worked per week in the analysis does not alter this latter finding.

These findings are similar to those obtained with bivariate analyses. We find, however, that men earn more than women even after controlling for personal, background, and work environment characteristics as well as number of hours worked per week. Thus our findings are similar to those obtained by others who have compared the earnings of employed women with those of men after controlling for relevant variables (Suter and Miller, 1973; Treiman and Terrell, 1974 and 1975). However, if extra pay had been assumed to be awarded for evening and weekend work, this difference would not have been as great since we found in Chapter III that the earnings of men and women are essentially identical after incorporating this assumption into the calculation of earnings per hour for men and women.

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[11] It should be noted that the monetary value of fringe benefits received by military physician assistants has not been included in this analysis.

In Chapter III we also reported that MEDEX graduates earn slightly more than graduates of assistant programs ($14,026 versus $13,857, respectively). The pattern of path coefficients associated with program dummy variables indicates that, after controlling for other variables, MEDEX graduates earn somewhat less than graduates of assistant programs. The explanation of this apparent discrepancy appears to be that MEDEX graduates completed their training earlier on the average than did graduates of assistant programs. Approximately 78% of the MEDEX graduates completed their training before 1974 compared to only 42% of graduates of assistant programs. Thus taking into account the effect of experience on income, MEDEX graduates earn somewhat less than graduates of assistant programs.

Graduates of associate programs still earn more than other graduates after controlling for personal, background, and work environment characteristics. As we pointed out in Chapter III, the greater earnings of graduates of associate programs most likely derive from the higher quality of training which they are assumed to have received.

The income benefit of employment in general primary care cannot be attributed to the greater number of hours worked by these persons. Most likely this finding indicates that general primary care physicians (i.e., family and general practitioners) are in greatest need of additional personnel and are therefore willing to pay slightly higher salaries in order to attract physician assistants.[12]

It should be noted that our model accounts for more variance in income than any other dependent variable except for level of responsibility. The R^2 for income is .211, meaning that 21.1% of the variance in income has been explained by the independent variables included in the model.

5. Prestige

The influences of personal, background, and work environment characteristics upon the physician assistant's perception of his occupational prestige as shown in Table 2 are all relatively weak. Community size has the strongest effect, with those working in smaller communities reporting greater prestige. Those in general primary care fields (SPCLTY 1) as well as those with greater interpersonal competence perceive their occupational prestige as more favorable. We suspect that those physician assistants working in smaller communities and in general primary care specialties consider their occupational prestige to be greater because their incomes are greater, they possess greater responsibility for patient care, and they have more favorable working relationships with their supervising physicians.

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[12] Family and general practitioners are located primarily in smaller communities where the per capita supply of physicians is more limited. The greater need for additional personnel in smaller communities would also explain the modest negative effect of community size upon income shown in Table 2.

6. Job Opportunities

The physician assistant's sex, interpersonal competence, and type of program attended all affect the perception of available job opportunities. Year of graduation from training has an effect as well, although weaker. Men rate their ability to obtain alternative employment more favorably than women, as do those with more effective interpersonal competence. Graduates of associate and military programs report more job possibilities than do other physician assistants. Finally, those who graduated earlier rate their job opportunities more favorably as well.

Women may report fewer available job opportunities because of their interest in only those jobs which do not require evening and weekend work.

Furthermore, for those women who are married, their choice of alternative jobs may be limited to the geographic area in which they are presently located while men may not be so constrained to the same degree.

The greater job opportunities reported by graduates of associate programs may be due to their attractiveness to potential employers because of the higher quality training which they are considered to have received. Perhaps the ready availability of other positions in the military reflects a need for additional primary care personnel which has arisen since the recent termination of the doctor draft. The influence of interpersonal skills upon the availability of job opportunities is most likely due not only to the importance of these skills to potential employers but also to the greater ability of persons with more effective interpersonal skills to learn about new jobs. Presumably, these persons have a more extended network of friends and acquaintances.[13] Finally, the greater availability of jobs perceived by earlier graduates suggests that experience as a physician assistant is a valuable asset in the location of new jobs.

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[13] Granovetter (1974) has shown that knowledge of job opportunities is most commonly obtained through informal channels of communication rather than through formal advertisements and announcements.

7. Career Opportunities

The final job characteristic included in this analysis concerns the physician assistant's perception of the availability of opportunities for career advancement in his present position. According to Table 2, more effective interpersonal competence has a substantial influence upon career opportunities, while graduating from a military program (PRGM 3) is associated with a sizeable negative influence.

These major effects upon career opportunities are reflected in the bivariate analyses as well. Those in the military report fewer opportunities for career advancement than civilians probably because military physician assistants are already close to the highest rank open to them.[14] In addition, the substantial amount of responsibility held by those in the military suggests that it is unlikely that they will obtain very much additional responsibility during the course of their careers.

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[14] All of the military physician assistants in this study are in the Air Force. These persons are all non-commissioned officers, a status which many respondents considered to be unjustly inferior to that which they deserved.

The path analysis findings which have been presented so far concern only direct effects. As the causal model in Figure 3 implies, personal and background characteristics may exert indirect effects upon job characteristics by virtue of influences mediated via work environment characteristics. In Table 3 we have presented the indirect effects upon job characteristics.[15]

All of these indirect effects are negligible except two, both of which are indirect effects upon level of responsibility. Approximately half of the total effects of both PRGM 2 (attending a MEDEX program) and PRGM 3 (attending a military program) upon level of responsibility for patient care are mediated by work environment characteristics. The total effect of attending a military program upon level of responsibility is almost twice as great as the effect of attending either a MEDEX or an associate program (PRGM 1). MEDEX and associate graduates possess a similar level of responsibility for patient care which is greater than that reported by graduates of assistant programs.

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[15] The indirect effects upon job performance and job satisfaction shown at the end of Table 3 will be discussed shortly.

Table 3

Decomposition of Total Effects for the Path Models Shown in Figures 3, 5, 6, and 8 Using the Self-Rating Measure of Job Performance

Dependent Variable	Predetermined Variable	Total Effect	Indirect Effect Via Work Environment Characteristics[a]	Indirect Effect Via Job Characteristics[a]	Direct Effect
LEV RESP	AGE	.107	.020	——	.087
	INTER COMP	.211	-.030	——	.241
	PRGM 1	.149	.008	——	.141
	PRGM 2	.124	.053	——	.071
	PRGM 3	.273	.126	——	.147
	PT PERF	.120	-.004	——	.124
	YR GRAD	-.107	-.001	——	-.106
MD ROLE SUP	INTER COMP	.089	-.027	——	.116
RN ACCEP	SEX	.095	.006	——	.089
	PRGM 1	.105	.001	——	.104
	ACAD PERF	.088	.003	——	.085
	YR GRAD	-.075	-.001	——	-.074
INCOME	AGE	.078	.012	——	.066
	SEX	.195	.018	——	.177
	INTER COMP	.125	-.018	——	.143
	NO YRS ED	.072	.002	——	.070
	PRGM 1	.124	-.003	——	.127
	PRGM 3	-.152	.017	——	-.169
	YR GRAD	-.217	.003	——	-.220
PRESTIGE	AGE	.095	.014	——	.081
	SEX	.070	.033	——	.037[b]
	INTER COMP	.084	-.029	——	.113
	PRGM 1	.087	-.005	——	.092
	PRGM 3	-.084	.009	——	-.093
	YR GRAD	-.079	.003	——	-.082
JOB OPP	SEX	.171	.003	——	.168
	INTER COMP	.135	-.012	——	.147
	PRGM 1	.157	.002	——	.155
	PRGM 3	.131	.021	——	.110
	YR GRAD	-.102	-.002	——	-.100
CAR OPP	INTER COMP	.227	-.018	——	.245
	PRGM 2	-.066[b]	.026	——	-.092
	PRGM 3	-.164	.014	——	-.178
	YR GRAD	.084	.001	——	.083

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[a] Levels of significance have not been computed for indirect effects.

[b] Level of significance greater than .001.

Table 3
(continued)

Dependent Variable	Predetermined Variable	Total Effect	Indirect Effect Via Work Environment Characteristics[a]	Indirect Effect Via Job Characteristics[a]	Direct Effect
JOB PERF	AGE	.118	.012	.043	.063
	SEX	.261	.010	.021	.230
	INTER COMP	.464	-.012	.143	.333
	PRGM 1	.078	.000	.080	-.002[b]
	PRGM 3	.098	-.009	.072	.036[b]
	ACAD PERF	.105	.010	.012	.083
	PT PERF	.190	-.013	.070	.133
JOB SAT	AGE	.124	.013	.033	.078
	SEX	.107	.023	.034	.050
	INTER COMP	.144	-.029	.167	.006[b]
	NO YRS ED	-.081	-.003	-.030	-.049
	NO YRS EXP	.086	.007	-.002	.081
	PRGM 2	.104	.050	-.017	.071
	YR GRAD	.007[b]	-.001	-.054	.062
	SPCLTY 1	.098	———	.128	-.030[b]
	SIZE COMM	-.153	———	-.142	-.011[b]

Approximately half of the influence of attending either a MEDEX or a military program upon level of responsibility can be explained by the greater likelihood of these physician assistants being located in work environments which are themselves associated with greater responsibility for patient care. Military graduates are working mainly in general primary care fields and in clinic settings. MEDEX graduates are more likely to be working in general primary care and in smaller communities. Each of these work environment characteristics is associated with greater responsibility for patient care.

In addition to computing indirect effects, it is also possible to compute the correlations between error terms associated with work environment characteristics and between those associated with job characteristics. The degree to which the zero order correlations between these variables are due to their mutual dependence upon prior variables in the causal model is assessed by the correlation of their error terms. This correlation is the same as the partial correlation obtained after controlling for all prior variables in the model. These results are presented in Table 1 of Appendix E.

C. Summary Discussion of Causal Influences Upon Work Environment and Job Characteristics

In this section, we will briefly summarize the above findings. To begin with, we have observed several sex-related differences among respondents. Women physician assistants are more likely to choose specialty primary care fields (chiefly general internal medicine), to locate in larger communities, to encounter slightly more problems in nurse acceptance, to earn less, and to perceive fewer available job opportunities.

We think that women physician assistants choose specialty primary care fields in larger cities chiefly because the hours required by this type of employment are more suitable to their interests. In addition, the choice of job location of married women physician assistants may be constrained by the career interests of their spouses who are more likely to find suitable employment in larger communities. Since the predominant specialty area of physician assistants in larger communities is specialty primary care, this would provide an explanation for the concentration of women physician assistants in this specialty area as well.

The slightly lower levels of nurse acceptance reported by women physician assistants may occur because nurses consider the physician assistant profession to be more appropriate for men or because nurses are more envious of the occupational rewards received by women physician assistants. Additionally, men continue to earn more even after controlling for personal, background, and work environment characteristics as well as number of hours worked per week. Treimen and Terrell suggest that the lower incomes of women in comparison to men with similar attributes are due to a combination of "direct economic discrimination against women in the labor market, institutional arrangements that constrain the opportunities of married women, and norms that permit (or require) married women to consider the non-income attributes of jobs" (1975, p. 198). Finally, the fewer available job opportunities reported by women may be due to their more limited geographic and temporal flexibility relative to men.

The physician assistant's rating of his interpersonal competence has a substantial influence upon two job characteristics in particular, level of responsibility for patient care and career opportunities. Other job characteristics affected by one's interpersonal skills include physician role support, income, perceived occupational prestige, and job opportunities. These findings suggest that being able to relate effectively with others is a highly valuable resource which enables those in a person-oriented field to obtain more desirable jobs.

Number of years of education and number of years of medical experience prior to beginning physician assistant training produce only weak or insignificant effects upon work environment and job characteristics. One might have anticipated both these variables to be positively associated with more desirable job characteristics, but this is apparently not the case. Sex, interpersonal competence, and type of physician assistant program attended appear to have much greater consequences for work environment and job characteristics than do prior education and experience.

Concerning the type of physician assistant program attended, we have observed that MEDEX graduates are more likely to be working in primary care fields and in smaller communities than other civilian physician assistants. Thus the MEDEX programs appear to have been more successful than associate or assistant programs in achieving the desired outcomes of producing graduates to provide primary care in areas with greater shortages of medical personnel. Military graduates, on the other hand, are more likely than their civilian counterparts to be working in primary care and in clinic practice settings.

Graduates of associate programs enjoy a number of more favorable job characteristics compared to the other physician assistants in our study. They report more responsibility for patient care, better nurse acceptance, higher incomes, greater perceived occupational prestige, and more job opportunities. A variety of explanations for these differences are plausible. Perhaps associate graduates possess more desirable jobs because they have greater academic ability than others,[16] because they have attended more prestigious programs, or because the training they received is considered to be of higher quality than that provided by other programs.

Although military graduates possess substantial amounts of responsibility for patient care and know of more job opportunities than civilian physician assistants, they also consider their occupational prestige and their career opportunities to be less favorable than do their civilian counterparts. The military physician assistants in our study are all non-commissioned officers while military nurses are granted commissions. Thus in spite of their considerable amount of responsibility, the highest rank which they can achieve is more limited than that of nurses in the military. As we mentioned earlier, quite a few respondents complained about this feature of military employment. Typical of these comments is the following:

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[16] We do not know for a fact that associate graduates have greater academic ability. However, these persons have obtained greater amounts of education prior to beginning their training, and the programs themselves seem to place greater emphasis upon academic ability.

> The Air Force has not seen fit to commission physician assistants. In my present capacity as a Chief Master Sergeant with over 19 years of experience and a B.S. degree in my field, I have become very embittered about this. I am not even allowed to lunch at the same table as nurses even though I have more education, more responsibility, and am even helping to train a nurse practitioner in clinical medicine at this time. Her rank is Captain and will soon be promoted to Major.

There appears, then, to be a discrepancy between the responsibilities of military physician assistants and the formal rewards which they receive.

Graduates of assistant programs are distinguished primarily by their relatively low level of responsibility for patient care. MEDEX graduates receive comparatively lower salaries than other civilian physician assistants after controlling for other personal, background, and work environment charracteristics. The lower salaries earned by MEDEX graduates may be due in part to the somewhat "captive" nature of their initial employment, since they are typically hired by the physician who served as their preceptor during training. Were MEDEX graduates able to search freely for employment following graduation, perhaps they would be able to obtain salaries more comparable to those received by other civilian physician assistants.

Performance during physician assistant training has only modest effects upon work environment and job characteristics. The greatest effect observed is the influence of performance in patient care activities during training upon level of responsibility for patient care. Year of graduation has a greater influence upon income than any of the other independent variables included in the analysis.

Employment in the field of general primary care carries with it several slightly more favorable job characteristics such as greater responsibility for patient care, greater physician role support, higher incomes, and greater perceived occupational prestige. Those employed in surgery and subspecialties report less responsibility for patient care. The only influence of practice setting upon job characteristics is that employment in institutional settings (principally clinics) results in greater responsibility for patient care.

The size of the community in which the physician assistant is employed has a negative effect upon all the job characteristics included in the analysis except one. Those in smaller communities report more responsibility for patient care, greater physician role support, higher incomes, greater occupational prestige, as well as more job and career opportunities. Thus, even though physician assistants in smaller communities generally work longer hours than others, they otherwise enjoy more favorable job characteristics. The comment of one respondent reflects these findings:

> Despite its attendent difficulties, I feel that I am in the most challenging, rewarding, and appropriate area for the physician assistant, that being small town and rural medicine.

Before proceeding to a presentation of our findings concerning job performance, we should point out that the independent variables included in our analysis account for a respectable percentage of the variance in the levels of responsibility and income reported by the study sample (27.7% and 21.1% respectively). However, only about 5% of the variance in specialty choice, physician role support, and nurse acceptance has been accounted for by our causal model. Consequently, additional research would be helpful in providing a greater understanding of the influences upon these important vocational outcomes.

III. Job Performance

We turn now to an examination of causal models of job performance. As we suggested in Chapter IV, there is an ambiguity in the causal relationships between job performance and job characteristics. Although the most plausible assumption would appear to be that job performance influences job characteristics such as level of responsibility, physician role support, nurse acceptance, and so forth, we did entertain the possibility that these job characteristics might themselves influence performance. For instance, a physician assistant who is delegated greater responsibility or who is given more role support by his supervising physician may perform better than if these job characteristics were less favorable. In addition, we also suggested that perhaps physician assistants consider their job characteristics (particularly the level of responsibility delegated to them) as an index of their own performance and consequently these characteristics may influence their self-evaluations of performance.

Because of this ambiguity, it has been necessary to develop two causal models of job performance. These are shown in Figures 4 and 5. In both models, job performance is assumed to be influenced by personal, background, and work environment characteristics. These models differ, however, in that

Figure 4

A Causal Model of Job Performance

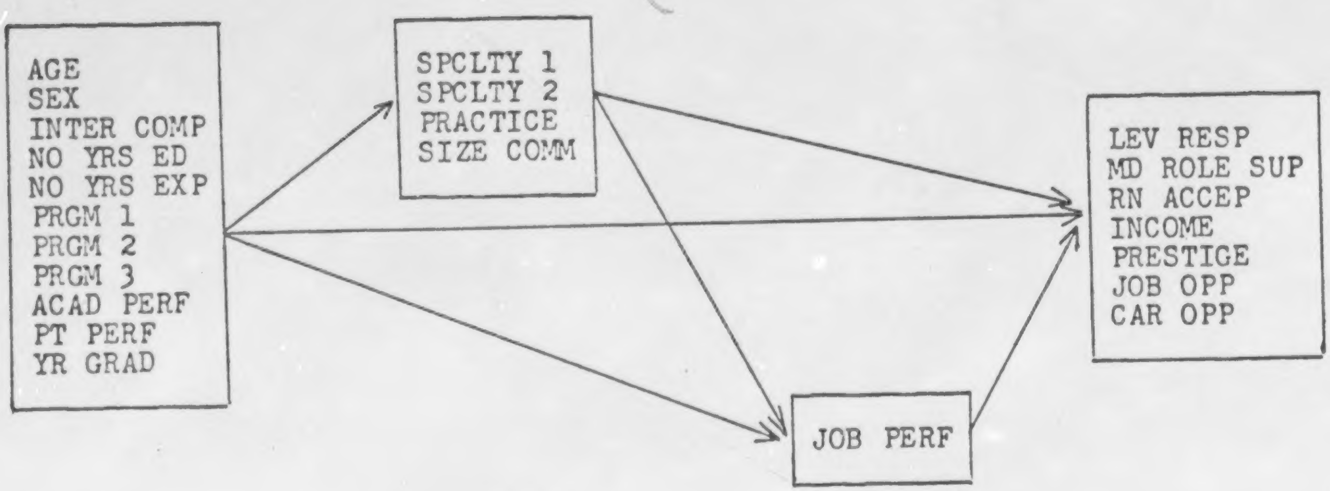
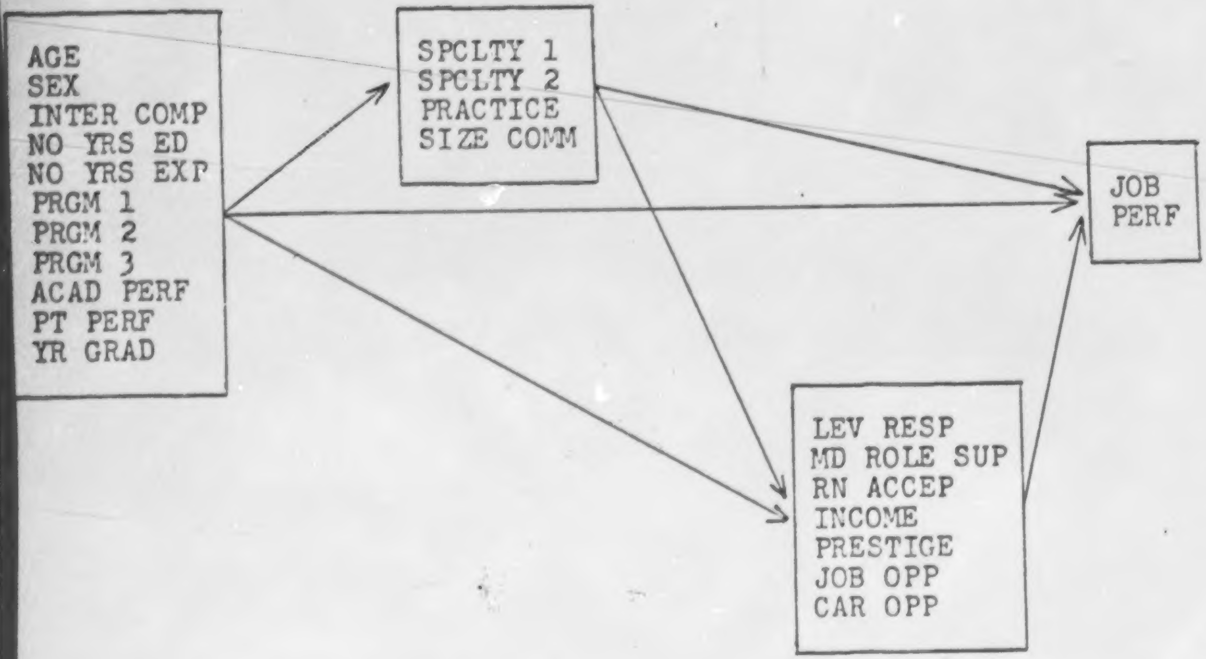

AGE
SEX
INTER COMP
NO YRS ED
NO YRS EXP
PRGM 1
PRGM 2
PRGM 3
ACAD PERF
PT PERF
YR GRAD
SPCLTY 1
SPCLTY 2
PRACTICE
SIZE COMM
LEV RESP
MD ROLE SUP
RN ACCEP
INCOME
PRESTIGE
JOB OPP
CAR OPP
JOB PERF

Figure 5

An Alternative Causal Model of Job Performance


AGE
SEX
INTER COMP
NO YRS ED
NO YRS EXP
PRGM 1
PRGM 2
PRGM 3
ACAD PERF
PT PERF
YR GRAD
SPCLTY 1
SPCLTY 2
PRACTICE
SIZE COMM
JOB PERF
LEV RESP
MD ROLE SUP
RN ACCEP
INCOME
PRESTIGE
JOB OPP
CAR OPP

the first assumes that job performance is influenced by job characteristics while the second assumes that job characteristics influence job performance.

To make matters more complicated still, we have two different performance measures which require separate analysis. Unfortunately, the cases upon which these analyses are based are somewhat different because performance ratings from supervising physicians are available for only two-thirds of the physician assistants in our study. The analyses employing the self-rating of performance are based upon 697 cases while those employing the physician performance rating are based upon 506 cases. In order to be sure that the differences obtained for these two different performance measures are not due to differences in the samples included in the analyses, we have conducted a third set of analyses using the self-rating of performance but with only those cases which were employed in the analysis of physician performance ratings.

A. Path Analysis Results for Job Performance

We will begin our presentation of these findings by discussing the path analyses of the causal model shown in Figure 4. The path coefficients associated with this model which were obtained using the self-rating measure of performance are shown in Table

4.[17] This analysis is based on the same sample of 697 respondents as that for the previously reported analyses. The first four columns in this table are identical to those shown in Table 2 since the causal relationships between personal, and background, and work environment characteristics remain unchanged from the causal model discussed previously.

Concerning the influences of personal, background, and work environment characteristics upon job performance one can see in the fifth column of Table 4 that interpersonal competence has by far the most important effect upon self-ratings of performance. The path coefficient associated with this relationship is .476, considerably larger than any others observed so far. This result suggests that one's perception of his ability to interact effectively with others has a major influence upon his perception of his own job performance. In short, physician assistants consider their interpersonal competence to be an essential component

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[17] The last column of this table, containing path coefficients for job satisfaction, will be discussed in the next section.

Table 4

Significant (p <.001) Standardized Path Coefficients For Causal Models Of Job Performance and Job Satisfaction In Figures 4 and 7 Using The Self-Rating Measure of Performance (N=697)

	SPCLTY 1	SPCLTY 2	PRACTICE	SIZE COMM	JOB PERF	LEV RESP	MD ROLE SUP	RN ACCEP	INCOME	PRES-TIGE	JOB OPP	CAR OPP	JOB SAT
AGE	.086				.106								.067
SEX		-.167		-.129	.251	-.173	-.138		.150		.106		
INTER COMP				.168	.476	-.109	-.144	-.149	.093			.111	-.053
NO YRS ED		-.092							.074				
NO YRS EXP													.081
PRGM 1					.078			.082	.119	.078	.135		
PRGM 2	.210		-.101	-.175		.056			-.099			-.097	.072
PRGM 3	.109	.080	.348		.108	.068	-.079	-.096	-.178			-.208	
ACAD PERF			-.068		.095	-.064			.069				
PT PERF	-.075				.203			-.078				-.075	.065
YR GRAD						-.072			-.215	-.074	-.039	.096	.062
SPCLTY 1					.108	.175			.094	.030			
SPCLTY 2						.146							
PRACTICE					-.076	.278	.099						-.038
SIZE COMM					-.053	-.149	-.120		-.070	-.125		-.071	
JOB PERF						.735	.545	.274	.106	.179	.247	.282	.178
LEV RESP													.160
MD ROLE SUP													.388
RN ACCEP													
INCOME													
PRESTIGE													.085
JOB OPP													.056
CAR OPP													.145
R^2	.089	.052	.135	.092	.467	.565	.209	.090	.217	.105	.152	.137	.551

of their job performance.[18]

Sex has the next strongest effect upon self-ratings of performance, with men rating their performance more favorably than women. Performance in patient care activities during training (PT PERF) has a substantial influence upon self-ratings of performance as well. Other variables with somewhat lesser, but still highly significant, influences upon self-ratings of performance include age, type of program attended, performance in basic science and classroom work during training, specialty, practice setting, and community size. Being older, graduating from an associate or military program, performing better in academic work during training, working in a general primary care field, in private practice settings, and in smaller communities all result in somewaht more favorable self-evaluations of job performance.

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[18] An alternative explanation was alluded to in Chapter IV which may account in part for the strength of this relationship. Since both these variables are self-ratings, it may be that individuals with favorable self-concepts rate themselves highly regardless of the characteristics being rated. Thus this relationship may be somewhat exaggerated due to personal predispositions toward favorable self-ratings which are independent of the actual characteristics being rated.

We next consider the influence of self-ratings of job performance upon job characteristics and how other influences upon job characteristics changed as a result of including this variable in our model. To begin with, one can see in Table 4 that self-evaluations of performance influence all the job characteristics in our analysis. The influences upon several of these characteristics are quite substantial. The effect of self-ratings upon level of responsibility of performance is remarkably high (.735) as is that upon physician role acceptance (.545). In addition, the effects upon nurse acceptance, job opportunities, and career opportunities are substantial as well, ranging between .247 and .282. Consequently, the R^2 associated with these variables has increased considerably. For level of responsibility it has increased from .277 (shown in Table 2) to .565 and for physician role support, from .051 to .209.

A number of the other path coefficients are substantially different from those reported earlier. For instance, the positive influences of interpersonal competence upon job characteristics observed in Table 2 have all become less, even to the point of becoming negative in some cases. Many of the other path coefficients associated with job characteristics are now smaller due to their mediation by self-ratings of job performance. The influences upon income and prestige are, however, largely unchanged due to the weak effect of self-ratings of performance upon these variables.

The changes in the path coefficients are more easily detected in Table 5, which describes the indirect effects of personal, background, and work environment characteristics mediated by self-ratings of job performance. These indirect effects indicate the magnitude and direction of change associated with each of the path coefficients after the introduction of self-ratings of performance into the model. By subtracting the indirect effect via performance from the initial direct effects shown in Table 2, one obtains the direct effects for the model in which job performance is included.

Several patterns can be observed in Table 5. First, of all, for most of the dependent variables shown, sex and interpersonal competence have sizeable positive indirect effects via self-ratings of job performance. Therefore, the direct effects of sex and interpersonal competence upon job characteristics is in most cases considerably reduced (and in fact negative in some cases) after adding self-ratings of performance to the analysis. The only other sizeable indirect effect via self-ratings of performance upon job characteristics is that for performance in patient care activities during training (PT PERF) upon level of responsibility.

Table 5

Decomposition of Total Effects for the Path Models Shown in Figures 4 and 7 Using the Self-Rating Measure of Job Performance

Dependent Variable	Predetermined Variable	Total Effect	Indirect Effect Via Work Environment Characteristics[a]	Indirect Effect Via Self-Rating of Job Performance	Indirect Effect Via Job Characteristics[a]	Direct Effect
JOB PERF	AGE	.118	.012	———	———	.106
	SEX	.261	.010	———	———	.250
	INTER COMP	.464	-.012	———	———	.476
	PRGM 1	.078	.000	———	———	.078
	PRGM 3	.099	-.010	———	———	.108
	ACAD PERF	.105	.010	———	———	.095
	PT PERF	.190	-.013	———	———	.203
LEV RESP	AGE	.107	.020	.078	———	.009[b]
	SEX	.010[b]	.001	.182	———	-.173
	INTER COMP	.211	-.030	.350	———	-.109
	PRGM 1	.149	.008	.057	———	.084
	PRGM 2	.124	.053	.015	———	.056
	PRGM 3	.273	.126	.079	———	.068
	PT PERF	.120	-.004	.149	———	-.025[b]
	SPCLTY 1	.255	———	.080	———	.175
	SPCLTY 2	.175	———	.029	———	.146
	PRACTICE	.222	———	-.056	———	.278
	SIZE COMM	-.183	———	-.039	———	-.149
MD ROLE SUP	SEX	.017[b]	.018	.139	———	-.138
	INTER COMP	.089	.027	.230	———	-.144
	PRGM 3	.018[b]	.038	.059	———	-.079
	SPCLTY 1	.104	———	.059	———	.045[b]
	PRACTICE	.058	———	-.041	———	.099
	SIZE COMM	-.148	———	-.028	———	-.120
PN ACCEP	SEX	.095	.006	.069	———	.020[b]
	INTER COMP	-.030[b]	-.011	.130	———	-.149
	PRGM 1	.105	.001	.021	———	.083
	PRGM 3	-.057[b]	.009	.030	———	-.096
	ACAD PERF	.089	.004	.026	———	.059
	PT PERF	-.024[b]	-.002	.056	———	-.078
INCOME	AGE	.078	.012	.011	———	.051[b]
	SEX	.195	.018	.026	———	.151
	INTER COMP	.125	-.018	.050	———	.093
	NO YRS ED	.072	.002	-.004	———	.074
	PRGM 1	.124	-.003	.008	———	.110
	PRGM 2	-.061[b]	.036	.002	———	-.099
	PRGM 3	-.152	.016	.010	———	-.178
	ACAD PERF	.083	.004	.010	———	.069
	YR GRAD	-.217	.003	-.005	———	-.215
	SPCLTY 1	.105	———	.011	———	.094
	SIZE COMM	-.075	———	-.005	———	-.070

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[a] Levels of significance for indirect effects have not been computed.

[b] Levels of significance greater than .001.

Table 5
(continued)

Dependent Variable	Predetermined Variable	Total Effect	Indirect Effect Via Work Environment Characteristics[a]	Indirect Effect Via Self-Rating of Job Performance	Indirect Effect Via Job Characteristics[a]	Direct Effect
PRESTIGE	AGE	.095	.014	.019	——	.062
	SEX	.070	.033	.045	——	-.008[b]
	INTER COMP	.084	-.029	.085	——	.028[b]
	PRGM 1	.087	-.005	.014	——	.078
	PRGM 3	-.084	.009	.020	——	-.113
	YR GRAD	-.079	.003	-.008	——	-.074
	SIZE COMM	-.135	——	-.010	——	-.125
JOB OPP	SEX	.173	.005	.062	——	.106
	INTER COMP	.135	-.012	.118	——	.029[b]
	PRGM 1	.157	.002	.020	——	.135
	PRGM 3	.135	.025	.026	——	.084
	YR GRAD	-.102	-.002	-.011	——	-.089
	SIZE COMM	-.076	——	-.012	——	-.064
CAR OPP	INTER COMP	.227	-.018	.134	——	.111
	PRGM 2	-.066	.026	.005	——	-.097
	PRGM 3	-.164	.014	.030	——	-.208
	PT PERF	-.020[b]	-.002	.057	——	-.075
	YR GRAD	.084	.001	-.013	——	.096
	SIZE COMM	-.086	——	-.015	——	-.071
JOB SAT	AGE	.124	.013	.063	-.019	.067
	SEX	.107	.023	.149	-.074	.009[b]
	INTER COMP	.144	-.022	.282	-.056	-.053[b]
	NO YRS ED	-.081	-.001	-.027	-.019	-.043
	NO YRS EXP	.086	.007	.003	-.005	.081
	PRGM 2	.104	.050	.011	-.029	.072
	PT PERF	.014[b]	-.010	.121	-.032	-.065
	YR GRAD	.007[b]	.001	-.028	-.028	.062
	SPCLTY 1	.098	——	.064	.059	.025[b]
	PRACTICE	-.038[b]	——	-.031	.081	-.088
	SIZE COMM	-.153	——	-.031	-.100	-.022
	JOB PER	.593	——	——	.415	.178

Otherwise, the parameters for the model which includes self-ratings of performance do not differ substantially from those obtained when this performance measure has been omitted.[19]

The findings obtained by including self-ratings of performance in a causal model in which performance is assumed to be interposed between work environment characteristics and job characteristics may be summarized as follows. Being male and rating one's interpersonal competence favorably have sizeable influences upon one's perception of his own performance. The other major influence upon self-ratings of job performance, though of somewhat less importance, is one's performance in patient care activities during training. This particular model assumes that job performance affects job characteristics. Our results using the self-rating performance measure indicate that all job characteristics, particularly level of responsibility and physician role rupport, are positively influenced by performance. The inclusion of self-ratings of performance among the causal influences upon job characteristics more than doubles the amount of variance in level of responsibility and physician role support explained by the model. The addition of self-ratings of performance produces sizeable reductions in the direct effects of sex, interpersonal competence, and performance in patient care activities during training upon job characteristics.

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[19] We will discuss shortly the indirect effects upon job satisfaction shown at the end of Table 5.

We will now describe the results obtained by analyzing this same causal model of job performance (shown in Figure 4) but using physician ratings instead of self-ratings of performance. The results of this analysis are shown in Table 6. The causal influences upon physician performance ratings, shown in the fifth column of this table, are rather different from those obtained in the analysis of self-ratings of performance.

The strongest influence upon physician ratings of performance is attending a military physician assistant program (PRGM 3). These graduates receive more favorable performance ratings from their supervising physicians than do other graduates. The performance of associate graduates (PRGM 1), on the other hand, is rated somewhat more negatively by supervising physicians. Performance in both academic and patient care activities during training (ACAD PERF and PT PERF) has a positive influence upon physician ratings of performance. Finally those who graduated earlier and those who are located in

Table 6

Significant (p < .001) Standardized Path Coefficients For Causal Models of Job Performance and Job Satisfaction in Figures 4 and 7 Using the Physician Rating of Performance (N=506)

	SPCLTY 1	SPCLTY 2	PRACTICE	SIZE COMM	JOB PERF	LEV RESP	MD ROLE SUP	RN ACCEP	INCOME	PRESTIGE	JOB OPP	CAR OPP	JOB SAT
AGE									.100				.111
SEX	.080	-.164		-.145				.096	.155		.176		
INTER COMP				.149		.236	.139		.158	.094	.199	.259	-.077
NO YRS ED		-.109									.081		.077
NO YRS EXP			-.097					-.114					
PROM 1		.089			-.112	.179		.126	.142	.093	.225		
PROM 2	.207			-.174		.032			-.117			-.096	.076
PROM 3	.119		.381		.164	.137	-.122		-.189	-.120	.140	-.201	
ACAD PERF			-.083		.118			.072					
PT PERF					.106	.080				.093			
YR GRAD					-.084	-.103		-.103	-.201	-.082	-.089	.116	.090
SPCLTY 1						.133			.103				
SPCLTY 2													
PRACTICE						.185	-.145						-.118
SIZE COMM					.102				-.095	-.100	-.093	-.118	
JOB PERF						.116	.392	.093	.113		.142	.133	
LEV RESP													.125
MD ROLE SUP													.372
RN ACCEP													.067
INCOME													.062
PRESTIGE													.059
JOB OPP													.108
CAR OPP													.164
R^2	.093	.059	.156	.095	.077	.211	.176	.078	.235	.088	.168	.133	.454

larger communities receive more favorable performance evaluations by supervising physicians as well. Unlike in the previous analysis, we find that sex and interpersonal competence are unrelated to physician evaluations of performance.

Finally, the independent variables included in this analysis are less successful in predicting physician ratings than in predicting self-ratings of performance. Only 7.7% of the variance in physician ratings is accounted for by the model compared to 46.7% of the variance of self-ratings. The influences upon physician ratings are fewer in number and more modest in magnitude than is the case for self-ratings of performance.

Concerning the influences of physician ratings of performance upon job characteristics, one can see in Table 6 that every job characteristic except prestige is positively influenced by physician ratings of performance. These influences are not as strong as those observed for self-ratings, however. The degree to which the direct effects of personal, background, and work environment characteristics have been affected by including physician ratings of performance in the analysis is shown in Table 7. Inspection of the indirect effects of personal, background, and work environment characteristics upon job characteristics in Table 7 which are mediated by physician ratings of performance reveals that all are .064 or less.[20] Therefore, the introduction of physician ratings of performance into the analysis has negligible effects upon these path coefficients.

There are thus several important differences in the results obtained by analyzing this causal model of job performance with each of the two different measures of performance. Using the self-rating measure, we find that being older, being a male, and possessing greater interpersonal competence is associated with more effective job performance, as is working in private practice settings and in smaller communities. None of these findings were substantiated with the physician rating of performance, however. In fact, physicians rated the performance of associate graduates and those working in smaller communities somewhat less favorably than that of others.

Several findings concerning the causal influences

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[20] An interesting finding contained in Table 7 is that the total effect of sex upon physician ratings of performance is significant and negative. Thus, in contrast to self-ratings, supervising physicians rate the performance of women somewhat more favorably than that for men.

Table 7

Decomposition of Total Effects for the Path Models Shown in Figures 4 and 7 Using the Physician Rating Measure of Job Performance

Dependent Variable	Predetermined Variable	Total Effect	Indirect Effect Via Work Environment Characteristics[a]	Indirect Effect Via Physician Ratings of Job Performance	Indirect Effect Via Job Characteristics[a]	Direct Effect
JOB PERF	SEX	-.075	-.019	——	——	-.056[b]
	PRGM 1	-.111	.001	——	——	-.112
	PRGM 3	.142	-.022	——	——	.164
	ACAD PERF	.120	.002	——	——	.118
	PT PERF	.106	.000	——	——	.106
	YR GRAD	-.083	.001	——	——	-.084
LEV RESP	INTER COMP	.224	-.003	-.009	——	.236
	PRGM 1	.176	.010	-.013	——	.179
	PRGM 2	.098	.016	.000	——	.082
	PRGM 3	.245	.089	.019	——	.137
	PT PERF	.097	.005	.012	——	.080
	YR GRAD	-.110	.003	-.010	——	-.103
	SPCLTY 1	.134	——	.000	——	.134
	PRACTICE	.178	——	-.007	——	.185
MD ROLE SUP	INTER COMP	.092[b]	-.018	-.029	——	.139
	PRGM 3	-.031	.027	.064	——	-.122
	SIZE COMM	-.105	——	.040	——	-.145
RN ACCEP	SEX	.092	.002	-.006	——	.096
	NO YRS EXP	-.112	.002	.000	——	-.114
	PRGM 1	.118	.002	-.010	——	.126
	ACAD PERF	.086	.003	.011	——	.072
	YR GRAD	-.112	-.001	-.008	——	-.103
INCOME	AGE	.111	.012	-.001	——	.010
	SEX	.173	.024	-.006	——	.155
	INTER COMP	.131	-.019	-.008	——	.158
	PRGM 1	.130	.001	-.013	——	.142
	PRGM 2	-.078	.038	.001	——	-.117
	PRGM 3	-.164	.007	.018	——	-.189
	ACAD PERF	.087	.006	.013	——	.068
	YR GRAD	-.210	.000	-.009	——	-.201
	SPCLTY 1	.104	——	.001	——	.103
	SIZE COMM	-.083	——	.012	——	-.095

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[a] Levels of significance for indirect effects have not been computed.
[b] Level of significance greater than .001.

Table 7
(continued)

Dependent Variable	Predetermined Variable	Total Effect	Indirect Effect Via Work Environment Characteristics[a]	Indirect Effect Via Physician Ratings of Job Performance	Indirect Effect Via Job Characteristics[a]	Direct Effect
PRESTIGE	INTER COMP	.076	-.020	.002		.094
	PRGM 1	.098	.002	.003	——	.093
	PRGM 3	-.116	.008	-.004	——	-.120
	PT PERF	.081	-.010	-.002	——	-.093
	YR GRAD	-.080	.000	.002	——	-.082
	SIZE COMM	-.103	——	-.003	——	-.100
JOB OPP	SEX	.176	.008	-.008	——	.176
	INTER COMP	.178	-.010	-.011	——	.199
	NO YRS ED	.081	-.003	.003	——	.081
	PRGM 1	.212	.003	-.016	——	.225
	PRGM 2	.090	.011	.001	——	.078
	PRGM 3	.182	.019	.023	——	.149
	YR GRAD	-.102	-.001	-.012	——	-.089
	SIZE COMM	-.078	——	.015	——	-.093
CAR OPP	INTER COMP	.223	-.021	-.010	——	.259
	PRGM 2	-.068[b]	.027	.001	——	-.096
	PRGM 3	-.179	.001	.021		-.201
	YR GRAD	.104	-.001	-.011		.116
	SIZE COMM	-.104	——	.014		-.118
JOB SAT	AGE	.143	.014	-.002	.019	.112
	NO YRS ED	-.095	-.001	.007	-.014	-.077
	NO YRS EXP	.092	.018	.002	-.005	.077
	PRGM 2	.109	.044	.001	-.012	.076
	PRGM 3	-.089	-.015	.044	-.069	-.049[b]
	ACAD PERF	.095	.014	.031	.019	.031[b]
	YR GRAD	.036[b]	-.001	-.022	-.031	.090
	PRACTICE	-.078	——	.017	-.057	.118
	SIZE COMM	-.112	——	.027	-.103	-.036[b]
	JOB PERF	.268	——	——	.201	.058[b]

upon performance were replicated, however. Both self-ratings and physician ratings of performance were more favorable for graduates of military programs as well as for those with superior performance in both academic and patient care activities during training.

We also found that performance has a positive causal influence upon job characteristics. Both performance measures exhibited significant positive effects upon all job characteristics (except that physician performance ratings did not influence prestige). The influence of self-rating measures upon job characteristics is considerably greater than that of physician ratings, however. Most of the other path coefficients associated with job characteristics were not greatly affected by the introduction of job performance into the model. Those coefficients describing the effects of sex, interpersonal competence, and patient performance during training were, however, reduced substantially by the inclusion of self-ratings of performance.

Since these separate analyses of the same causal model using the two separate measures of performance are based on different sample sizes, some of the differences in the parameters of the model may be explainable on the basis of the different samples involved. In order to assess this possibility, we have analyzed this causal model again, using the self-ratings measure of performance but with only those same cases which were included in the analysis based on physician ratings of performance. That is, this third analysis estimates the model parameters associated with self-ratings of performance for 506 rather than 697 cases. These results, which are presented in Table 2 in Appendix E, indicate that the path coefficients associated with job performance and job characteristics undergo only minor changes after a furter reduction in sample size. Thus the differences in results obtained with each of the performance measures cannot be attributed to sample differences

As we have noted previously, we cannot be sure that this causal model of performance is entirely adequate since job characteristics possibly influence actual job performance or perhaps one's perception of his performance. Figure 5 (p.233), describes an alternative model of job performance in which performance is assumed to be influenced by job characteristics as well as by personal, background, and work environment characteristics.

The estimated parameters for this model obtained by using self-ratings of performance are shown in Table 2 (p. 200). The only portion of this table of interest at present is the next to the last column, in which the direct effects upon job performance are presented.

Being male and possessing a favorable level of interpersonal competence are again found to have a sizeable influence upon self-ratings of performance. Performance in academic and patient care activities is also found to have significant, though relatively weak, influences upon this performance measure. Direct program effects are no longer present, however.

According to this model, level of responsibility has the most important influence upon self-ratings of performance, the path coefficient being .471. The only other job characteristics with significant influences upon self-ratings of performance are physician role support and job opportunities. Each of these effects is rather weak, however. Thus the major differences in the results obtained in the analysis of this alternative model using self-ratings of performance are that direct program differences are eliminated and level of responsibility emerges as the major influence upon job performance. The model also accounts for a greater percentage of the variance in this measure of performance (70.4% compared to 46.7% in the model in which job performance is not influenced by job characteristics).

This, of course, does not imply that the alternative model is the more correct one, however.

The mediation of the effect of prior variables upon self-ratings of performance by job characteristics is shown near the bottom of Table 3 (p. 222). Interpersonal competence possesses a sizeable indirect effect (.143) upon self-ratings of performance via job characteristics. In addition, almost all of the total positive effect of PRGM 1 (attending a military program) upon self-ratings of performance is mediated via job characteristics.

Turning now to an assessment of this same causal model, but using physician ratings rather than self-ratings of performance, it can be seen in Table 8 that both sex and interpersonal characteristics now have negative effects upon performance. The effects of program and performance during training remain similar to those obtained from the previous analysis of physician ratings of performance. That is, graduating from a military program and performing better in academic and patient care activities during training are associated with more favorable physician ratings while graduating from an associate program is associated with less favorable physician ratings. Among job characteristics, physician role support has the greatest influence

Table 8

Significant ($p < .001$) Standardized Path Coefficients for Causal Models of Job Performance and Job Satisfaction in Figures 5 and 8 Using the Physician Rating of Performance (N=506)

	SPCLTY 1	SPCLTY 2	PRACTICE	SIZE COMM	LEV RESPON	MD ROLE SUP	RN ACCEP	INCOME	PRESTIGE	JOB OPP	CAR OPP	JOB PERF	JOB SAT
AGE								.099					
SEX	.080	-.164		.145			.090	.149		.168		-.106	.110
INTER COMP				.149	.227	.110		.150	.096	.188	.249	-.151	
NO YRS ED		-.109								.084			-.076
NO YRS EXP			-.097				-.114						.077
PRGM 1		.089			.116		.116	.129	.096	.209		-.153	
PRGM 2	.207				.082			-.116			-.095		.077
PRGM 3	.118		.381	-.173	.156			.171	-.124	.153	-.180	.170	
ACAD PERF			-.083					.081				.085	
PT PERF					.092	-.105			.091			.100	
YR GRAD					-.112		-.110	-.210		-.101	.105		.088
SPCLTY 1					.131			.104					
SPCLTY 2													
PRACTICE					.177							-.089	-.123
SIZE COMM								-.083	-.103		-.104	.151	
LEV RESP													.126
MD ROLE SUP												.369	.394
RN ACCEP													.067
INCOME												.111	.068
PRESTIGE												-.089	
JOB OPP												.123	.115
CAR OPP													.164
R^2	.093	.059	.156	.095	.199	.034	.070	.224	.088	.149	.117	.242	.451

(.369) upon physician ratings of performance, with somewhat lesser effects observed for income and job opportunities. The R^2 associated with this measure of performance is substantially greater than that observed in the earlier model (.242 versus .077). The indirect effects of personal, background, and work environment characteristics which are mediated via job characteristics are shown in Table 9. None of these effects are particularly noteworthy.

We have reanalyzed this same causal model using the self-rating of performance but limiting the sample to those included in the analysis using the physician rating of performance. Comparing the results of this analysis, shown in Table 3 of Appendix F, with those shown in Table 2 for a slightly larger case base reveals only minor differences. Thus we conclude, as we did previously, that the difference in sample size in the analyses using physician ratings as compared with self-rating measures of performance does not account for the differences in the results obtained.

B. Summary Discussion of Results Obtained for Path Analyses of Job Performance

What have we learned from this rather complex analysis of job performance? We have presented four separate and somewhat different sets of findings since we have employed two separate measures of

Table 9

Decomposition of Total Effects for the Path Model
Shown in Figure 5 Using Physician
Ratings of Job Performance

Dependent Variable	Predetermined Variable	Total Effect	Indirect Effect Via Work Environment Characteristics[a]	Indirect Effect Via Job Characteristics[a]	Direct Effect
Job Perf	SEX	-.075	-.019	.050	-.106
	INTER COMP	-.059[b]	.016	.076	-.151
	PRGM 1	-.111	.001	.041	-.153
	PRGM 3	.142	-.022	-.00[illegible]	.170
	ACAD PERF	.120	.002	.033	.035
	PT PERF	.106	.000	.006	.100
	YR GRAD	-.083	.001	-.046	-.038[b]
	SIZE COMM	.102	--	-.049	.151

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[a] Levels of significance for indirect effects have not been computed.

[b] Level of significance greater than .001.

performance and have developed two different causal models of performance. Here we will summarize our findings concerning the job performance of physician assistants. In Table 10 the direct effects of independent variables upon performance obtained for each of these analyses are compared. Model I assumes that job characteristics are influenced by job performance while Model II assumes that performance is influenced by job characteristics.

The only finding consistently reproduced by each of these analyses is that performance during training (as determined by both performance in basic science and classroom work as well as by performance in patient care activities) has a weak effect upon job performance. Otherwise, our findings have rather disparate implications.

The most striking disparity in these findings, as can be seen in Table 10, is that sex and interpersonal competence greatly influence self-ratings of performance but have either an insignificant or a reversed effect upon physician ratings of performance. That is, being a male and rating one's interpersonal competence favorably are strongly and positively associated with self-evaluations of performance while these same characteristics have either an insignificant or negative influence upon physician ratings of performance.

Table 10

Summary of Significant ($p < .001$) Direct Causal Influence Upon Job Performance

INDEPENDENT VARIABLE	SELF-RATINGS OF PERFORMANCE		PHYSICIAN RATINGS OF PERFORMANCE	
	MODEL I[a]	MODEL II[b]	MODEL I[a]	MODEL II[b]
AGE	.106	.063		
SEX	.250	.231		-.106
INTER COMP	.476	.333		-.151
NO YRS ED				
NO YRS EXP				
PRGM 1	.078		-.112	-.153
PRGM 2				
PRGM 3	.108		.164	.170
ACAD PERF	.095	.083	.118	.085
PT PERF	.203	.133	.106	.100
YR GRAD			-.084	
SPCLTY 1	.108			
SPCLTY 2		-.050		
PRACTICE	-.076	-.191		-.089
SIZE COMM	-.053	.063	.102	.151
LEV RESP	—	.471	—	
MD ROLE SUP	—	.112	—	.369
RN ACCEP	—		—	
INCOME	—		—	.111
PRESTIGE	—		—	-.089
JOB OPP	—	.084	—	.123
CAR OPP	—		—	

[a] MODEL I, shown in Figure 3, assumes that job characteristics are influenced by job performance.

[b] MODEL II, shown in Figure 4, assumes that job performance is influenced by job characteristics.

Another notable difference in these findings is that according to Model I, graduating from an associate program has a positive influence upon self-ratings of job performance while this same characteristic is negatively associated with physician ratings of performance. Graduating from a military program, on the other hand, is positively associated with job performance in three of the four analyses which we have conducted.

Work environment characteristics (SPCLTY 1, SPCLTY 2, PRACTICE, and SIZE COMM) have weak, conflicting, or insignificant influences upon job performance. Level of responsibility for patient care has a marked positive influence upon self-ratings of performance according to Model II but it is unrelated to physician ratings.

All but one of the personal and background characteristics which were found in the bivariate analysis to be significantly related to self-ratings of performance remain after controlling for other independent variables. We found in Chapter IV a significant but weak correlation (.158) between number of years of medical experience before beginning physician assistant training and self-ratings of performance. Apparently, this bivariate relationship is explained by the association of prior medical experience with both age and graduating from a military physician assistant program. Consequently, the path coefficient for the influence of prior medical experience upon self-ratings of performance is negligible.

In Chapter IV, we did not find any significant bivariate relationships between personal or background characteristics and physician ratings of performance. According to our path analysis findings, however, graduating from an associate program is consistently related to somewhat more negative performance ratings by supervising physicians while graduating from a military program and performing well in academic and patient care activities is consistently related to slightly more favorable performance ratings by supervising physicians.

The effect of type of physician assistant program attended upon physician performance ratings deserves additional comment since it is a finding not previously encountered in our analyses and its explanation is not readily apparent. One possible cause for the lower performance ratings received by graduates of associate programs may be the level of performance expectations held by supervising physicians. That is, physicians supervising graduates of associate programs may hold higher expectations for their performance than those held by physicians supervising other graduates. Thus, even if associate graduates actually performed equally as well as other graduates, associate graduates might nevertheless receive lower performance ratings because the expectations of their supervising physicians were less adequately fulfilled. Another possible explanation, of course, is that after controlling for personal and background characteristics, associate graduates do actually perform slightly less favorably than others.

The other observed program effect is that graduates of military physician assistant programs receive slightly more favorable performance evaluations from their supervising physicians than do others. The interpretation for this finding which we favor is that the greater responsibility entrusted to these graduates has a beneficial effect upon their performance. The delegation of greater responsibility may provide military physician assistants with opportunities to "rise to the occasion", to upgrade their own skills, and to demonstrate their performance capabilities to a greater degree than is the case for civilian physician assistants.

Supervising physicians may hold lower expectations for the performance of military physician assistants than for that of other graduates, since the prior educational attainments of military graduates are generally more modest and they are older. Thus, assuming that their actual performance is identical to that of other physician assistants, military graduates may be given somewhat higher performance evaluations because the performance expectations of their supervising physicians is more frequently exceeded.

These explanations are highly tentative and deserve further investigation. The policy implications of these findings are limited, however, since the actual differences in performance ratings by type of program attended are rather modest in magnitude.

The significant but weak effect of performance during training upon job performance may reflect, in part, the recency with which physician assistants have completed their training. We suspect that if these same respondents were studied in five or ten years,no significant influence of performance during training upon job performance would be present. Such have been the findings of studies of physicians and nurses (Peterson et al, 1956; Taylor, et al, 1964; Richards et al, 1965; Saffer and Saffer, 1972; Wingard and Williamson, 1973). Thus, on-the-job experience appears to become an increasingly important determinant of job performance as one advances in his professional career.

The results of our analyses concerning the relationships between job performance and job characteristics are totally dependent upon the assumptions adopted regarding the direction of causal influence between these variables. In the analyses in which causal influences of performance upon job characteristics are permitted, we find that practically all of the job characteristics included in the analysis are influenced by both performance measures. For the analysis in which job characteristics are assumed to influence performance, responsibility for patient care and physician role support emerge as the major determinants of performance.

This latter finding provides us with a tentative conclusion identical to that suggested by the bivariate analysis of job performance. Although the data are not conclusive, they nevertheless are compatible with the possibility that expanding a physician assistant's level of responsibility for patient care and improving the level of role support provided by his supervising physician would enhance his job performance.

In conclusion, the job performance of physician assistants deserves an even more elaborate assessment than has been attempted in this project. The personal, background, and work environment characteristics included in our analysis have a generally weak impact upon physician performance ratings. Even though their influence upon self-ratings is substantially greater, we suspect that this may reflect biases in self-reported measures (as described in Chapter IV) rather than the reality of the situation. Future studies of the job performance of physician assistants might profit by a more objective assessment of particular dimensions of performance rather than by using the subjective rating methods of overall performance employed in our study.

IV. Job Satisfaction

The final set of path analysis findings to be considered concern the causal influences upon job satisfaction. To begin with, we will describe the influences of personal, background, work environment, and job characteristics upon job satisfaction. Following this, we will present the findings obtained by including job performance in our causal model of job satisfaction.

A. Influences of Personal, Background, Work Environment, and Job Characteristics Upon Job Satisfaction

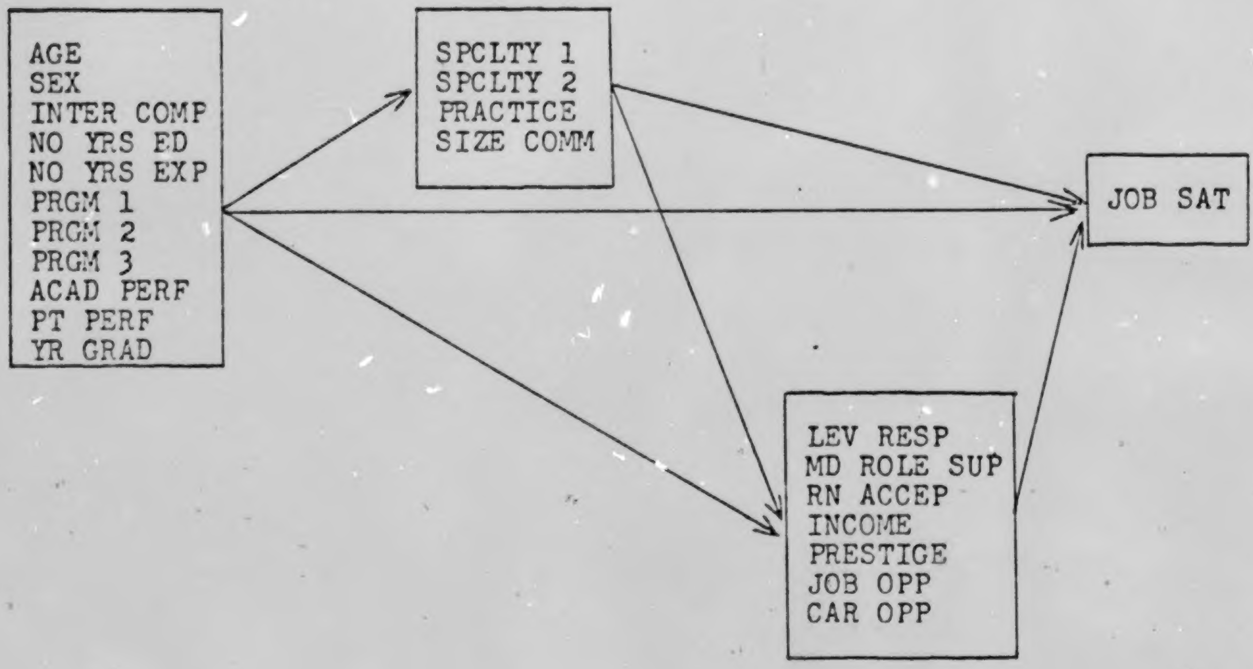
The causal model which has been developed to assess the influences of personal, background, work environment, and job characteristics upon job satisfaction is shown in Figure 6. Job satisfaction is assumed to be dependent upon personal, background, work environment, and job characteristics, all of which retain the same causal orderings presented previously. Consequently, the estimated parameters for all the relationships between these variables except those involving job satisfaction have already been discussed.

The direct effects of prior variables in the model shown in Figure 6 upon job satisfaction are contained in the last column of Table 2 (p. 200). Examination of this column reveals that physician role support has by far the greatest consequence for the physician assistant's job satisfaction, with a path coefficient of .408. Level of responsibility for patient care has the next greatest influence upon job satisfaction, with a path coefficient of .244. Only two other independent variables have a direct effect upon job satisfaction greater than .10: level of career opportunities perceived by the respondent, and working in a private practice setting.

There are a number of additional variables which have relatively weak but still significant

Figure 6

A Causal Model of Job Satisfaction


AGE
SEX
INTER COMP
NO YRS ED
NO YRS EXP
PRGM 1
PRGM 2
PRGM 3
ACAD PERF
PT PERF
YR GRAD
SPCLTY 1
SPCLTY 2
PRACTICE
SIZE COMM
JOB SAT
LEV RESP
MD ROLE SUP
RN ACCEP
INCOME
PRESTIGE
JOB OPP
CAR OPP

direct effects upon job satisfaction. Older physician assistants report somewhat greater levels of job satisfaction after controlling for the other independent variables included in the model. Men are slightly more satisfied with their work than women. The amount of medical experience before beginning physician assistant training has a positive effect upon job satisfaction while more prior education has a slight negative effect. Graduating from a MEDEX program (PRGM 2) results in somewhat greater job satisfaction. Furthermore, those who graduated more recently report slightly greater job satisfaction as do those with more favorable levels of nurse acceptance, perceived occupational prestige, and perceived job opportunities. Interestingly, income has no significant direct effect upon job satisfaction.

This causal model provides a rather extensive understanding of the job satisfaction of physician assistants. As shown in Table 2, 54.2% of the variance in this variable is accounted for by the independent variables included in the model.

The decomposition of total effects upon job satisfaction is presented at the bottom of Table 3 (p. 222). Several variables have sizeable total effects upon job satisfaction but because their effects are mediated by subsequent variables, their direct effects are negligible. According to Table 3, the total effect of community size upon job satisfaction is -.153, meaning that working in a smaller community results in greater job satisfaction. This effect is mediated entirely by job characteristics, however, so that the direct effect of community size upon job satisfaction is negligible (-.011). Those who locate in smaller communities possess greater responsibility for patient care, greater physician role support, greater perceived occupational prestige, more job opportunities, and more career opportunities. These job characteristics, in turn, all have significant and positive direct effects upon job satisfaction.

Similar findings can be observed in Table 3 for interpersonal competence, whose total effect upon job satisfaction is .144. This effect is mediated entirely by those same job characteristics which mediate the influence of community size. Approximately one-third of the total effect (.124) of age upon job satisfaction is mediated by work environment and job characteristics. The total effect of sex upon job satisfaction is .107. All other personal and background variables in the analysis controlled for, men report greater job satisfaction than women. Approximately half this effect is mediated by work environment and job characteristics. These indirect effects are due principally to the greater predisposition of women to locate in larger communities, to receive somewhat less favoarble nurse acceptance, and to report fewer alternative job possibilities, all of which tend to reduce their job satisfaction slightly.

Referring again to the bottom of Table 3, it can be seen that attending a MEDEX program has a total effect of .104 upon job satisfaction. About half of this effect is mediated by work environment characteristics and is due primarily to the greater tendency of MEDEX graduates to work in private practice settings, in smaller communities, and in general primary care specialties.

Although working in a general primary care specialty has no significant direct effect upon job satisfaction, its total effect (shown in Table 3) is .098. Most of this effect is mediated by job characteristics which themselves have positive consequences for job satisfaction. That is, those working in general primary care fields possess greater responsibility for patient care, greater physician role support, as well as greater perceived occupational prestige.

An additional finding of interest concerning the partitioning of effects upon job satisfaction shown in Table 3 is that year of graduation has a weak positive direct effect upon job satisfaction and an indirect effect mediated by job characteristics which is similar in magnitude but negative. Thus the total effect for this variable is essentially zero. More recent graduates report slightly less favorable nurse acceptance, occupational prestige, and alternative job opportunities, which have positive effects upon job satisfaction. These effects controlled for, however, more recent graduates report slightly more favorable job satisfaction than earlier graduates. More recent graduates may possess greater enthusiasm for their new roles, while earlier graduates may be loosing some of this enthusiasm as they anticipate a future of limited career opportunities.

Finally, Table 3 also reveals that the type of practice setting has a positive indirect effect on job satisfaction which is mediated by job characteristics (principally level of responsibility) while it exerts a negative direct effect which is similar in magnitude. Thus the total effect of practice setting upon job satisfaction is insignificant. Working in an institutional setting results in greater job satisfaction because the greater responsibility held by these persons has a beneficial effect upon job satisfaction. Controlling for this relationship, however, we find that employment in private practice settings results in greater job satisfaction.

The findings obtained for job satisfaction by means of path analysis are to a large extent similar to those reported earlier with bivariate analytic techniques. One bivariate relationship did not remain when examined within a multivariate framework, however. Although the zero-order correlation between income and job satisfaction is .159, the path coefficient for this relationship is nonsignificant. Thus income has no effect upon job satisfaction once the correlations between income and other variables associated with job satisfaction have been controlled. Earlier analyses revealed no significant bivariate relationships between job satisfaction and sex, number of years of prior education, or type of physician assistant program attended. These variables do have a significant effect upon job satisfaction when other independent variables are held constant, however. Several other variables which were weakly associated in the bivariate analysis with either career satisfaction or expected length of employment but not with job satisfaction were found to have a significant influence upon job satisfaction when assessed within a multivariate framework. These variables are interpersonal competence, specialty, and practice setting.

These rather minor differences aside, the major findings from the bivariate analysis of job satisfaction are upheld: physician role support, level of responsibility for patient care, and perception of career opportunities have the greatest influence upon the physician assistant's job satisfaction. Because of the physician assistant's close working relationship with his supervising physician and the dependance of the physician assistant's job characteristics upon his supervising physician, it is not surprising that the quality of this interpersonal relationship, as viewed by the physician assistant, has marked influence upon his job satisfaction. A good working relationship with one's supervising physician is satisfying in its own right, not to mention the likely consequences of such a working relationship upon other job characteristics which themselves contribute to job satisfaction.

The importance of level of responsibility for job satisfaction has several likely explanations. Physician assistants expect that they will have substantial responsibility for patient care.

Once they are employed, if this expectation is not met, dissatisfaction may result. Furthermore, one's level of responsibility for patient care is likely to be a major source of one's professional identity. Possessing substantial responsibility for patient care fosters a greater sense of self-worth and of having contributed to the practice setting in which one is employed. Finally, being able to use one's knowledge and skills in a way that results in direct benefit to patients is intrinsically satisfying as well.

The opportunities for career advancement which physician assistants perceive in their jobs also influence job satisfaction, although less so than does physician role support or level of responsibility for patient care. Physician assistants do appear to be quite interested in career advancement, as evidenced by their plans for continuing their education. Thus, it is not surprising that perceptions of opportunities for advancement have an important influence upon his job satisfaction.

The influences of work environment characteristics upon job satisfaction are not marked. Working in a smaller community, in a private practice setting, and in a general primary care field all have weak positive effects upon job satisfaction. To a large extent, the greater job satisfaction of MEDEX graduates can be attributed to their employment in this type of work environment. Employment in smaller communities and in general primary care fields results in greater job satisfaction because the job characteristics associated with this type of employment are more favorable.

Exactly why employment in private practice settings should result in greater job satisfaction than does employment in institutional settings is less clear, especially since institutional employment generally carries with it greater responsibility for patient care. Employment in private practice settings is not associated with any other job characteristics which influence job satisfaction. One plausible explanation for this finding is based on the fact that most private practice settings are smaller organizations than institutional settings. Those studies reviewed by Porter and Lawler (1965) also have shown job satisfaction to be greater in smaller organizations. Their explanation for this finding is that smaller organizations possess less task specialization and more supportive interpersonal relationships. This explanation may be appropriate for our findings as well.

The negative influence of amount of prior education upon job satisfaction is consistent with findings obtained by Kalleberg (1974) in a path analysis of job satisfaction in other occupations. He found that amount of education has a negative direct effect upon job satisfaction, although it has a sizeable indirect positive influence which is mediated by occupational prestige and income. The interpretation proposed for this finding rests in part on arguments set forth by Berg (1970) that, all other things held equal, more highly educated workers are more likely to have higher expectations for their jobs than others and they may have more ability (or possess more training) than their jobs require. Both of these conditions are assumed to have negative consequences for job satisfaction.

Although the negative direct effect of prior education upon job satisfaction is small, its implications are not trivial since the physician assistant profession is attracting persons with greater prior educational attainments. If one assumes that the job characteristics for physician assistants will remain unchanged, the general level of job satisfaction of physician assistants may well decline. On the other hand, the recruitment of more highly educated persons may serve as a stimulus to upgrade the physician assistant profession by providing greater responsibility, incomes, and career opportunities for its members.

The positive effect of greater prior medical experience upon job satisfaction may be related to the likelihood that those with greater prior experience before becoming a physician assistant are more appreciative of their present status. The upward mobility which they have experienced in their careers may be a source of job satisfaction not available to those who have not been previously employed before entering the physician assistant profession.

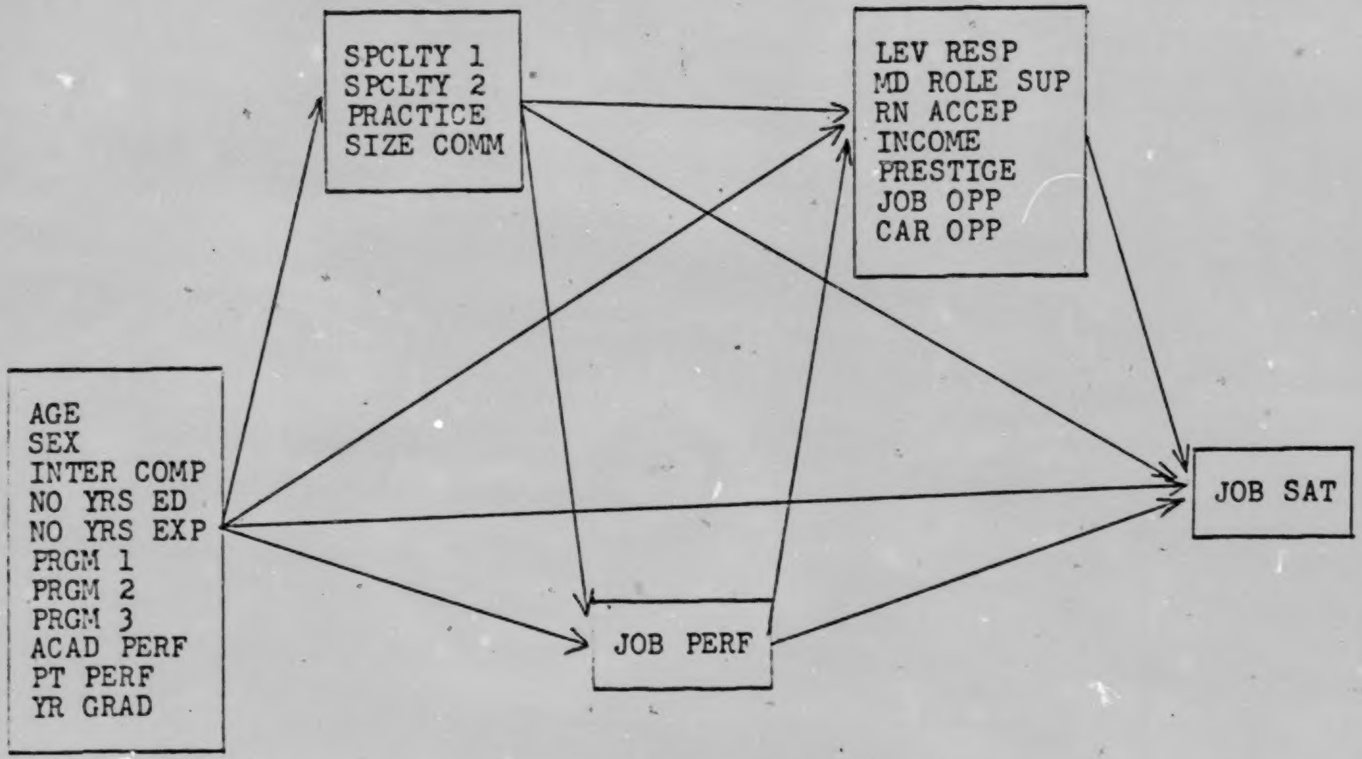
The path analyses which we have described so far have not included job performance and job satisfaction together. In the following section, we will describe several causal models which include both these variables.

B. An Analysis of Causal Models Which Contain Both Job Performance and Job Satisfaction

As we have discussed previously, job performance and job satisfaction have been shown in previous research to be weakly correlated (Vroom, 1964, p. 183), although the direction of causation in this relationship has been debated in the literature (Schwab and Cummings, 1970). Our inclination is to consider the job performance of physician assistants as influencing job satisfaction. One causal model which incorporates this assumption is shown in Figure 7. Here, job performance is permitted to have both a direct effect upon job satisfaction

Figure 7

A Causal Model of Job Performance and Job Satisfaction


SPCLTY 1
SPCLTY 2
PRACTICE
SIZE COMM
LEV RESP
MD ROLE SUP
RN ACCEP
INCOME
PRESTIGE
JOB OPP
CAR OPP
AGE
SEX
INTER COMP
NO YRS ED
NO YRS EXP
PRGM 1
PRGM 2
PRGM 3
ACAD PERF
PT PERF
YR GRAD
JOB PERF
JOB SAT

as well as an indirect effect which is mediated by job characteristics. This model is identical to that shown in Figure 4 which we described earlier except that a final dependent variable, job satisfaction, has been added. The estimated parameters for this combined model of job performance and job satisfaction are presented in Tables 4 through 7. Only those path coefficients for job satisfaction will concern us here since the other findings shown in these tables have already been discussed.

When the self-rating performance measure is employed in the analysis of this model, we find in Table 4 (p. 236) that job performance exerts a modest direct effect (.178) upon job satisfaction. The other path coefficients for job satisfaction are changed only slightly after including self-ratings of performance in the model, as can be seen by comparing these coefficients in Table 4 with those in Table 2 (p. 200). The amount of variance in job satisfaction explained after adding self-ratings of performance to the model increases only slightly from 54.2% (shown in Table 2) to 55.1% (shown in Table 4).

Self-ratings of job performance have a sizeable indirect influence upon job satisfaction, however.

At the bottom of Table 5 (p. 240) it can be seen that the influence of job performance mediated by job characteristics is quite high, .415. Thus the total effect of job performance upon job satisfaction is .593, and most of this effect is transmitted by job characteristics. That is to say, more favorable job performance leads to more favorable job characteristics which, in turn, have beneficial effects upon job satisfaction.

What are our findings when physician ratings of performance are used in the analysis of this model? In this case, as shown in Table 6 (p. 244), job performance has an insignificant direct effect upon job satisfaction. The influences of other study variables upon job satisfaction are virtually unchanged by including this performance measure in the analysis, as can be seen by comparing the path coefficients for job satisfaction in Table 6 with those in Table 8 (p. 253).

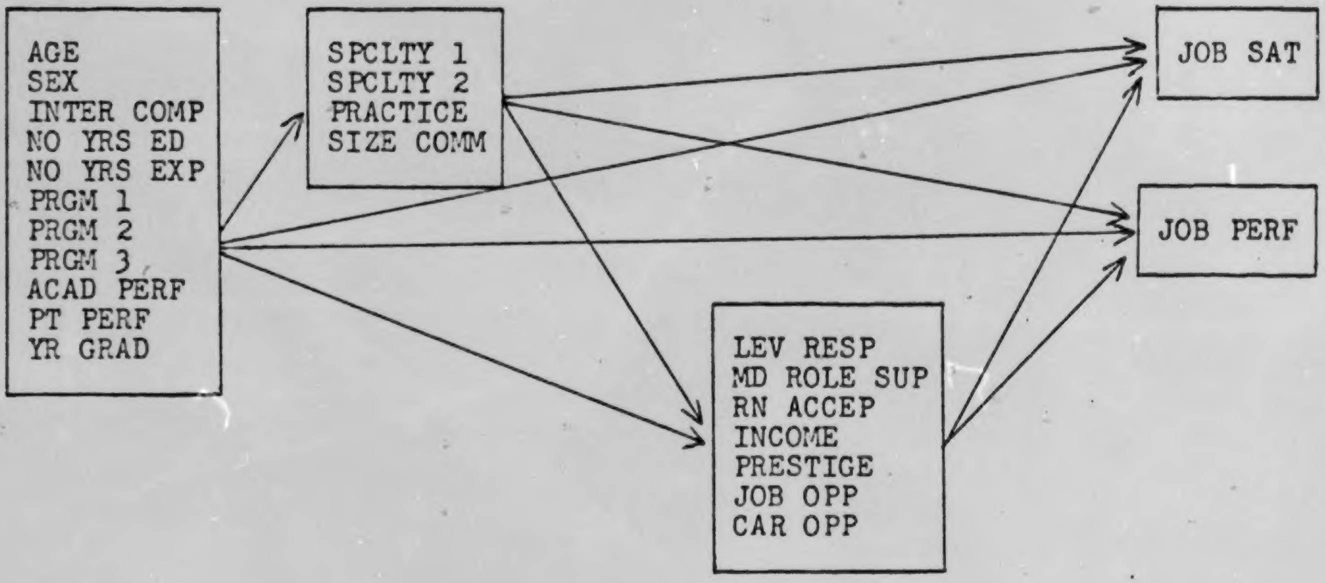
Even though performance, as determined by physician ratings, does not influence satisfaction directly, a sizeable indirect effect (.201) which is mediated by job characteristics is shown at the bottom of Table 7 (p. 248). Thus, as with self-ratings of performance, the effect of physician performance ratings upon job satisfaction is transmitted primarily through its effect upon job characteristics. The inclusion of physician ratings of performance does not improve the amount of variance in job satisfaction explained by the model, however. Comparing the R^2 values for job satisfaction shown in Tables 8 and 6, it can be seen that they are essentially the same (45.4% versus 45.1%).

Our findings imply that job performance affects job satisfaction by virtue of beneficial consequences for the job characteristics of physician assistants. The validity of this implication rests upon the adequacy of the causal assumptions adopted in the development of the model. Although these assumptions are plausible, they cannot be rigorously defended and our findings in no way substantiate their appropriateness.

Therefore, we have developed yet another causal model of job performance and job satisfaction together, shown in Figure 8. Although we consider this model less tenable than the one shown in Figure 7, the causal relationships it contains are nevertheless plausible and deserve consideration. Job performance and job satisfaction are no longer assumed to be directly related. Furthermore, job performance is assumed to be influenced by job characteristics.

Figure 8

An Alternative Combined Model of Job Performance and Job Satisfaction


AGE
SEX
INTER COMP
NO YRS ED
NO YRS EXP
PRGM 1
PRGM 2
PRGM 3
ACAD PERF
PT PERF
YR GRAD
SPCLTY 1
SPCLTY 2
PRACTICE
SIZE COMM
LEV RESP
MD ROLE SUP
RN ACCEP
INCOME
PRESTIGE
JOB OPP
CAR OPP
JOB SAT
JOB PERF

The estimated parameters for this model have all been discussed previously and are presented in Table 2 (where self-ratings of performance are used) and in Table 8 (where physician ratings of performance are used). The correlation between the error terms for job performance and job satisfaction are of interest here, since its magnitude in relation to the zero order correlation between these variables provides an estimation of the extent to which these variables are mutually dependent upon prior variables in the model. This is because the correlation between error terms is the same as the partial correlation between these variables obtained by controlling for all prior variables in the model.

The zero order correlation, corrected for attenuation, between self-ratings of job performance and job satisfaction is .520. The correlation between the error terms for these variables according to the causal model shown in Figure 8 is only .050, meaning that practically all of the correlation between these two variables can (if the underlying causal assumptions are valid) be attributed to their joint dependence upon prior variables in the model.

When physician performance ratings are used to carry out these computations, somewhat different results are obtained. The zero order correlation between these two variables is .240 after correction for attenuation, whereas the correlation between their error terms is -.143, suggesting that performance (as determined by physician ratings) actually has a negative relationship with job satisfaction after the prior variables in the causal model shown in Figure 8 have been controlled.

For both measures of job performance, then, our analysis of this causal model suggests that the observed zero order correlations can be largely attributed to the joint dependence of performance and satisfaction upon the independent variables in the model if the underlying causal assumptions are appropriate. Our inclination, however, is to consider the causal ordering shown in Figure 7 as more appropriate.

In conclusion, an analysis of job performance and job satisfaction together in the same causal models provides the following conclusions. For the causal models in which job performance is assumed to influence job satisfaction, we find that performance exerts its main effect upon job satisfaction indirectly through job characteristics. The inclusion of performance does not improve the amount of variance in job satisfaction which is accounted for by this model, however.

An analysis of an alternative combined model of performance and satisfaction in which these two variables are assumed to have no causal relationship between themselves, indicates that the zero order correlation between performance and satisfaction can be largely accounted for by their mutual relationships with prior variables in the model. The causal assumptions underlying this model appear to be somewhat less plausible than those for the model in which performance is assumed to influence satisfaction, however.

V. Summary

In this chapter we have described the results obtained by path analyses of the general characteristics, the job performance, and the job satisfaction of physician assistants. Our findings are largely consistent with those obtained by bivariate analyses of these variables. We will summarize here a few of the major findings reported in this chapter.

MEDEX graduates are more likely than other respondents to be working in primary care fields and in smaller communities. Graduates of associate programs, on the other hand, report a number of more favorable job characteristics, including responsibility for patient care, nurse acceptance, income, occupational prestige, and job opportunities. Those working in general primary care fields (that is, general or family practice) possess a number of more favorable job characteristics as well, as do those employed in smaller communities. Perhaps these more favorable job characteristics will serve as an attraction to new graduates to seek employment in general primary care fields and in smaller communities where the needs for additional medical manpower are generally greater.

The analyses of job performance have been complicated by discrepancies in the results depending upon the particular performance measure used and by the ambiguity in the causal relationship between performance and job characteristics. Our only consistent findings were that performance during training appears to influence job performance, but only weakly. Graduating from a military physician assistant program results in more favorable performance evaluations by supervising physicians, while graduating from an associate program results in somewhat less favorable performance evaluations. Whether these findings indicate actual differences in performance or differences in the performance expectations held by supervising physicians cannot be determined from our data, however.

The major influences upon job satisfaction were found to be the level of physician role support, level of responsibility for patient care, and the level of career opportunities perceived by the respondent. These variables, together with those having weaker influences upon job satisfaction, account for over half of the variance in this dependent variable.

Our presentation of the empirical findings from this project is now complete. In the final chapter, we will discuss some of the policy implications of these results.

CHAPTER VI

POLICY IMPLICATIONS

Since the present project is the first large-scale, comprehensive investigation of the physician assistant profession, our findings should be of interest to those concerned with shaping health manpower policy in the United States. Therefore, in this final chapter we will present our assessment of the most important policy implications suggested by the results of this project.

Our data indicate that physician assistants are improving the specialty and geographic maldistribution of medical manpower in the United States. Physician assistants are more likely than physicians to be working in primary care fields and in smaller communities. Over three-fourths of the physician assistants included in our study are working in primary care fields and over half are working in communities with populations of 50,000 or less.

For these reasons, we feel that the continued growth of the physician assistant profession, aided by federal support for physician assistant training, is justified. The physician assistant profession has the potential for making a major contribution in improving the availability of medical care in primary care fields and in smaller communities. The multivariate analyses which we have conducted indicate that employment in general primary care fields and in smaller communities results in a number of more favorable job characteristics, including greater responsibility for patient care, physician role support, income and perceived occupational prestige. We expect that physician assistants will continue to be attracted to these types of employment because of the professional opportunities which they provide.

Our analysis indicates that MEDEX programs have been more successful than other civilian physician assistant programs in preparing their graduates for employment in primary care fields and in smaller communities. Furthermore, their practical, on-the-job training by practicing physicians results in job performance which is at least as good as that for graduates of other civilian programs who are trained primarily by medical school faculty. Finally, our multivariate analyses suggest that graduating from a MEDEX program results in greater job satisfaction than does graduating from other types of physician assistant programs.

We believe that the MEDEX philosophy of physician assistant training deserves more widespread implementation. MEDEX programs are generally located in geographic areas where a recognized need for additional medical manpower exists. The programs themselves take an active role in locating employment opportunities for their graduates in areas where access to medical care is limited. Finally, on-the-job training by practicing physicians who intend to hire the trainee following graduation has the advantage of creating realistic expectations for the physician assistant's role following graduation. Perhaps this, in part, contributes to the greater job satisfaction reported by MEDEX graduates.

A small number of our respondents indicated that they were functioning in roles more or less analagous to those performed by interns and residents. We feel that the policy implications of this finding are substantial. There is a growing concern about the overproduction of certain types of specialists (especially surgeons) and the increasing numbers of foreign medical graduates who obtain their residency training in the United States (Bunker, 1970; Sprague et al, 1974; Weiss et al, 1974). In large part, these problems have arisen because the development of residency programs has been geared more to the needs of the sponsoring hospitals than to the medical manpower needs of the country (Creditor and Creditor, 1975).

The replacement of house staff physicians by physician assistants (or other allied health professionals such as nurse practitioners and nurse-midwives) appears to be feasible and could reduce the nations's dependence upon foreign medical graduates as well as reduce the overproduction of certain types of medical specialists. Burnett (1972) and Hatcher and Fleming (1974) have previously described training programs in which these changes have been successfully adopted.

The limited career opportunities which our respondents forsee should be a source of considerable concern for those interested in the future vitality of the physician assistant profession. Opportunities for career advancement seem to be quite important to physician assistants, and such opportunities within the profession are felt to be scarce. Therefore, many are obtaining additional education, applying to medical schools, and considering entry into different occupational fields.

A number of proposals might be advanced to improve this situation. Employers could be encouraged to expand the level of responsibility for patient care and to augment the incomes of physician assistants as they become more experienced. The majority of our respondents express a desire for greater patient care responsibility and almost half feel their supervising physicians do not provide adequate help in improving their clinical skills. Physician assistants possess considerable income generating potential since patients are generally charged equal fees regardless of whether they are seen by the supervising physician or by the physician assistant, and private health insurers reimburse providers on this basis as well (Comptroller General, 1975, pp.34-36). Therefore the amount of revenue generated by physician assistants frequently exceeds their salary and overhead expenses. One report (Nelson et al, 1975) suggests that a physician assistant employed in a private practice setting accrues between $8,000 and $14,000 profit for his supervising physician. Thus it would appear that there are ample funds available to increase the salaries of physician assistants as they become more experienced.

An alternative method of improving the career opportunities for physician assistants has been described by Silver (1974), who proposes that physician assistants be trained to provide primary care with physicians serving only as consultants and advisors. This would allow physician assistants to become independent, fee-for-service practitioners of primary care. Although the desirability of this proposal deserves much additional consideration, it has considerable advantages for physician assistants, who would be able to exercise greater responsibility for patient care and earn substantially greater incomes. Thus it would expand the career opportunities available to those in the profession.

A final possibility for dealing with the problem of career opportunities available to physician assistants concerns the type of individual who is recruited into the profession. Were persons with somewhat lower career aspirations recruited, then the present level of career opportunities might be more adequate.

One of the problems with the work-related rewards received by physician assistants appears to be that they will reach an early peak in the first several years following entry into the profession and then plateau. This may be a problem for an individual who enters the physician assistant profession early in his vocational career and who has relatively high career aspirations. It might not be as great a problem, however, for an individual who has been employed for some time in another allied health occupation and who otherwise would have no significant advancement opportunities ahead of him. Entry into the physician assistant profession for this type of person might be a major career advancement, and such a person would probably not expect the same level of future career advancement opportunities as those entering the profession at an earlier age.

Physician assistants who have greater prior experience in other medical fields before entering a physician assistant program generally have more limited prior education than other physician assistants. Their job performance, however, is at least as good as that for those with greater prior educational attainments. Furthermore, the path analyses we have conducted indicate that greater prior education has a significant negative effect upon job satisfaction, while greater medical experience before becoming a physician assistant has a significant positive effect. Our bivariate analyses reveal significant positive correlations between number of years of prior medical experience and both career satisfaction and expected length of employment in one's present position.

One interpretation of these findings is that those with less prior education and more prior medical experience have lower expectations for the work-related rewards provided by the physician assistant profession. Consequently, they express greater satisfaction with their work. If this argument is correct, then one would also expect these persons to be more accepting of the present state of career opportunities in the profession. Thus, a strong case can be made for placing additional emphasis upon the recruitment of those with greater prior medical experience and less prior education into the profession, especially if it appears that the career opportunities available to physician assistants are not likely to be expanded.

The fact that approximately one-quarter of our study sample indicate a strong interest in attending medical school suggests that the issue of entry of physician assistants into the medical profession is likely to become increasingly important, particularly if career opportunities within the physician assistant profession do not improve. Problems of morale and entry into other occupational fields may become important as well if suitable career opportunities are not developed.

Our analysis of the job performance of physician assistants may have raised more questions than it has answered. The lack of correspondence between self-evaluations and those provided by supervising physicians makes many of our findings difficult to interpret. It appears to us that the physician-rating measure of performance is a more adequate measure of actual job performance, mainly because they do not seem to be influenced by extraneous factors to the same degree as do self-ratings.

The overall level of performance of physician assistants is quite favorable according to the evaluations provided by supervising physicians. Three-quarters of the supervising physicians are "greatly pleased" with the work of their physician assistant and would rehire the same physician assistant if they "had it to do over again".

In the bivariate analysis, only level of responsibility for patient care and physician role support were related to both self-ratings and physician ratings of performance. The interpretation of these relationships remains problematic, however, since it is not clear to what extent one's job performance is actually influenced by the level of responsibility and physician role support present in his job. This is because these job characteristics are themselves likely to be influenced by one's job performance. In the path analysis of a causal model in which job performance is assumed to influence these and other job characteristics, sizeable influences of performance upon responsibility and physician role support were obtained. In an alternative causal model in which performance is assumed to be influenced by job characteristics, sizeable influences of responsibility and physician role support were observed. We think there is some validity in each of these observations. Although our data are not conclusive, they are at least compatable with the notion that increasing a physician assistant's level of responsibility for patient care and the level of role support provided by his supervising physician will have beneficial effects upon his job performance. This tentative suggestion is the only policy-related implication obtained by our analysis of job performance.

Our path analyses indicate that attending a military physician assistant program has a positive influence upon physician performance ratings while attending an associate program has a negative influence. These effects are not substantial, however, and deserve independent confirmation. They are nevertheless surprising since associate programs are considered by many to provide higher quality training than other programs. The prior performance expectations of supervising physicians may have affected their evaluations. That is, associate graduates may perform as well as other graduates but receive lower performance evaluations because their supervising physicians have higher expectations for them than for other graduates. Therefore, we are reluctant to draw any policy implications from this finding.

Finally, our path analysis of the job performance of physician assistants suggests that performance during training exerts only a weak influence upon job performance. These findings are consistent with those obtained by similar studies of physicians and nurses (Peterson et al, 1956; Taylor et al, 1964; Richards et al, 1965; Saffer and Saffer, 1972; Wingard and Williamson, 1973) and suggest that a physician assistant's class standing should not be given particular attention by potential employers.

The analyses of the job satisfaction of physician assistants which we have conducted indicate that physician assistants possess a level of satisfaction which is similar to that reported for other professionals. Their level of career satisfaction appears to exceed that reported for a group of school superintendents, and their job turnover is substantially lower than that for nurses. Although job satisfaction measures are significantly related to a number of study variables, both the bivariate as well as the path analyses indicate that the following three variables have the greatest influence on job satisfaction: level of role support provided by the supervising physician, perceived availability of opportunities for career advancement in one's present position, and level of responsibility for patient care.

A high degree of personal support and acceptance along with continued professional education by the supervising physician appear to be essential for the development of a high level of job satisfaction among physician assistants. The influence of perceived career opportunities upon job satisfaction suggests that such opportunities are quite important to our respondents, and thus the limited level of these opportunities which they report should be given serious consideration. Finally, a satisfying professional experience as a physician assistant appears to be dependent upon performing an influential role in patient management. Not only is such a role more stimulating and challenging, but it is probably more congruent with the expectations developed by physician assistants during their training. Possessing substantial responsibility for patient care fosters a greater sense of self-worth and of having contributed to the practice setting in which one is employed.

Furthermore, making responsible decisions in patient management which improve a patient's well-being is intrinsically satisfying.

The policy implications of these findings are straightforward. Greater job satisfaction of physician assistants should result following an improvement in their role support provided by supervising physicians, their career opportunities, and their level of responsibility for patient care.

Future large-scale studies which are representative of the physician assistant profession will be necessary to reassess the general characteristics of the profession as it continues to expand rapidly and as its role in the provision of medical care in the United States becomes more important. Future studies of the influences upon the job performance of physician assistants might profit by a more objective measure of performance than the ones we have developed. Additional research concerned with the job satisfaction and the career opportunities of physician assistants appears to be indicated to determine if the available professional rewards are sufficient to prevent problems of morale and entry into other fields, particularly for those who are more advanced in their careers.

Finally, our research suggests that a fruitful area of further theoretical and empirical work in vocational psychology concerns elucidating the causal relationships between job characteristics, job performance, and job satisfaction. Little attention has been given to this topic so far. The multivariate analytic technique which we have employed requires the development of explicit assumptions regarding these causal relationships. In many cases, the causal relationships between these variables are probably reciprocal rather than unidirectional. Thus the analysis of nonrecursive models in which reciprocal causal influences can be assessed (see Duncan, 1975, pp. 67-99) may provide a useful approach toward increasing our understanding of the causal relationships between job characteristics, job performance, and job satisfaction.

APPENDIX A

QUESTIONNAIRE SENT TO PHYSICIAN ASSISTANTS

A
P
A
P

Association of Physicians' Assistant Programs
2120 L STREET N W THE GELMAN BUILDING
WASHINGTON D C 20037
(202) 833-1280

DONALD W FISHER Ph D
EXECUTIVE DIRECTOR

November 25, 1974

Dear Physician Assistant:

As one of the first members of an entirely new health profession, your early career experiences are of great interest to those of us who are training future physician assistants. We want to learn what you have been doing since your graduation and what you think about your role as a physician assistant.

This is the subject of the enclosed questionnaire. It has been developed in cooperation with the Association of Physician Assistant Programs by Dr. Henry Perry of the Johns Hopkins University. Although the questionnaire appears lengthy, each question can be answered rapidly. Most respondents so far have completed the questionnaire in thirty minutes. Many have found it to be thought-provoking as well.

Your responses will, of course, remain confidential. We would like to share the results of this study with you. If you are interested in receiving a summary of our major findings, indicate this in the space at the end of the questionnaire.

Thanking you in advance for your participation,

Sincerely yours,

Donald W. Fisher

Donald W. Fisher, Ph.D
Executive Director

DWF/cs
Enclosure

Association of Physicians' Assistant Programs
2120 L STREET N.W. THE GELMAN BUILDING
WASHINGTON D.C. 20037
(202) 833 1280

DONALD W. FISHER PH.D
EXECUTIVE DIRECTOR

January 13, 1975

Dear Physician Assistant:

About one month ago we mailed you a questionnaire concerned with your professional experiences as a physician assistant. No doubt you have received other questionnaires in the recent past. We understand your reluctance to complete yet another one, but your reactions to your role as a Physician Assistant are of great importance to us and are needed for the successful completion of this project.

We will be happy to send you a copy of the major findings of this study if you desire. We are looking forward to hearing from you soon.

Sincerely yours,

Donald W. Fisher, Ph. D.
Executive Director

DWF:de

THE JOHNS HOPKINS UNIVERSITY · BALTIMORE, MARYLAND 21218

DEPARTMENT OF
SOCIAL RELATIONS

March 3, 1975

Dear Physician Assistant:

You may recall that in December you received a questionnaire concerning your professional experiences as a physician assistant. We are still most interested in hearing from you. In case you have misplaced your earlier questionnaire, we are enclosing another one with return postage for your convenience.

Although the questionnaire is lengthy, many respondents have indicated that they found it to be thought provoking. Moreover, most have completed it in less than thirty minutes.

A summary of the major findings of this study will be available in the early fall. If you would like to receive a copy, indicate this at the end of the questionnaire.

Your response is essential in obtaining a complete assessment of the current role of physician assistants in the delivery of health services in the United States. Your cooperation is greatly appreciated.

Sincerely yours,

Henry B. Perry, M.D.

Enclosure

HBP:jh

SURVEY OF THE VOCATIONAL EXPERIENCE OF PHYSICIAN ASSISTANTS

Please answer each question by checking the response category which you feel answers the question best. If a particular question is not applicable to your present work experience, simply leave that question blank.

1. Choose the ONE of the following statements which best tells how well you like your job: Place a check (✓) in front of that statement:

   (1) _____ I hate it
   (2) _____ I dislike it
   (3) _____ I do not like it
   (4) _____ I am indifferent to it
   (5) _____ I like it
   (6) _____ I am enthusiastic about it
   (7) _____ I love it

2. Check one of the following to show HOW MUCH OF THE TIME you feel satisfied with your job:

   (1) _____ all of the time
   (2) _____ most of the time
   (3) _____ a good deal of the time
   (4) _____ about half of the time
   (5) _____ occasionally
   (6) _____ seldom
   (7) _____ never

3. Check the ONE of the following which best tells how you feel about changing your job:

(1) _____ I would quit this job at once if I could get anything else to do

(2) _____ I would take almost any other job in which I could earn as much as I am now earning

(3) _____ I would like to change both my job and my occupation

(4) _____ I would like to exchange my present job for another job in the same line of work

(5) _____ I am not eager to change my job, but I would do so if I could get a better job

(6) _____ I cannot think of any jobs for which I would exchange mine

(7) _____ I would not exchange my job for any other

4. Check one of the following to show how you think you compare with other people:

(1) _____ No one likes his job better than I like mine

(2) _____ I like my job much better than most people like theirs

(3) _____ I like my job better than most people like theirs

(4) _____ I like my job about as well as most people like theirs

(5) _____ I dislike my job more than most people dislike theirs

(6) _____ I dislike my job much more than most people dislike theirs

(7) _____ No one dislikes his job more than I dislike mine

5. How much confidence do you think your supervising physician has in the work you do?

(1) _____ complete confidence

(2) _____ almost complete confidence

(3) _____ a lot of confidence

(4) _____ quite a bit of confidence

(5) _____ a fair amount of confidence

6. How well do you relate to patients?

(1) _____ as well as any of the people I work with

(2) _____ quite a bit better than most of the people I work with

(3) _____ better than most of the people I work with

(4) _____ about as well as most of the people I work with

(5) _____ not quite as well as most of the people I work with

7. How knowledgeable are you about the various clinical problems which you see in your work?

(1) _____ extremely knowledgeable

(2) _____ quite knowledgeable

(3) _____ fairly knowledgeable

(4) _____ somewhat knowledgeable

(5) _____ not too knowledgeable

8. How often do you feel you have done an exceedingly good job at work?

(1) _____ almost always

(2) _____ most of the time

(3) _____ frequently

(4) _____ sometimes

(5) _____ almost never

9. How does being a physician assistant compare with other types of work?

(1) _____ it is the most satisfying career one could follow

(2) _____ it is one of the most satisfying careers

(3) _____ it is as satisfying as most careers

(4) _____ it is less satisfying than most careers

10. If you "had it to do over again," would you become a physician assistant?

(1) _____ definitely yes

(2) _____ probably yes

(3) _____ probably no

(4) _____ definitely no

11. Has your career as a physician assistant lived up to the expectations you had before you entered it?

(1) _____ yes, in all respects

(2) _____ in most ways

(3) _____ in some ways

(4) _____ in only a few ways

12. If a friend of yours were considering a career in the health field, would you advise him to apply to a physician assistant program?

(1) _____ definitely yes

(2) _____ probably yes

(3) _____ probably not

(4) _____ definitely not

13. How much does being a physician assistant give you a chance to do the things at which you are best?

(1) _____ a very good chance

(2) _____ a fairly good chance

(3) _____ some chance

(4) _____ little chance

14. How many features of the job of a physician assistant do you dislike?

(1) _____ quite a few

(2) _____ several

(3) _____ only a couple

(4) _____ none

15. If I were absolutely free to go into any kind of work I wanted, my choice would be: (be as specific as you can)

____

____

16. Given my personal abilities and experience, the type of work I would like to be doing 10 years from now is: (be as specific as you can)

____

____

17. What are your career plans? (Check one or more of the appropriate categories.)

(1) _____ continue in my present position or one similar to it

(2) _____ learn additional clinical skills

(3) _____ earn a bachelor's degree

(4) _____ earn a master's degree

(5) _____ earn a Ph.D. degree

(6) _____ enter medical school

(7) _____ other (specify: ____________________________)

18. Which of the following activities would you like to become more involved in if you were given the opportunity? (Check one or more of the appropriate categories.)

(1) _____ teaching

(2) _____ administration

(3) _____ supervision

(4) _____ additional responsibilities for patient care

(5) _____ research

(6) _____ other (specify: ____________________________)

19. How long have you been employed in your present job?

_____years and _____months

20. How much longer do you expect to continue working for your present employer?

(1) _____ less than 6 months

(2) _____ less than 1 year

(3) _____ a couple of years

(4) _____ about 5 years

(5) _____ indefinitely

21. How difficult do you think it would be for you to obtain a job as a physician assistant if you decided to leave your present position?

(1) _____ it would be almost impossible to locate another job

(2) _____ it would be quite difficult to locate another job, but I could probably locate one eventually

(3) _____ I could find one without too much difficulty

(4) _____ I could locate one with very little effort

(5) _____ I already know of one or more positions available to me

In questions 22-30, the term "supervising physician" refers to the single physician you are working closest with at the present time. If there is no single physician with whom you work most closely, answer the question for the group of physicians with whom you are most closely associated.

22. Does your supervising physician take an interest in you as a person as well as how competently you do your job?

(1) _____ yes

(2) _____ no

23. When you ask your supervising physician a question about your work do you receive adequate consideration?

(1) _____ yes

(2) _____ no

24. Do you feel that you are given adequate opportunity to present problems, complaints, or suggestions to your supervising physician?

(1) _____ yes

(2) _____ no

25. Do you feel that your supervising physician is interested in getting your ideas and suggestions?

(1) _____ yes

(2) _____ no

26. Does your supervising physician usually give you recognition for work well done?

(1) _____ yes

(2) _____ no

27. Does your supervising physician spend very much time helping you to improve your clinical skills?

(1) _____ yes

(2) _____ no

28. Is your supervising physician interested in discussing problems in patient management with you?

(1) _____ yes

(2) _____ no

29. Generally speaking, are you satisfied with your supervising physician?

(1) _____ yes

(2) _____ no

30. Is your supervising physician board certified?

(1) _____ yes

(2) _____ no

(3) _____ don't know

31. How much responsibility do you have for patient care?

(1) _____ not too much responsibility

(2) _____ a moderate amount of responsibility

(3) _____ a considerable amount of responsibility

(4) _____ a very great amount of responsibility

32. Do you feel that you are allowed to make decisions about those aspects of patient care for which you received appropriate training?

(1) _____ yes, definitely

(2) _____ yes, to a certain degree

(3) _____ no, usually not

(4) _____ no, never

33. Do you have much influence on the way your patients are cared for?

(1) _____ yes, I have a lot of influence

(2) _____ yes, I have a fair amount of influence

(3) _____ no, I don't have too much influence

(4) _____ no, I have very little influence

Check whether the following statements are true or false.

	TRUE (1)	FALSE (2)
34. I have a reputation for being able to cope with difficult people	____	____
35. I find it easy to talk with all kinds of people	____	____
36. I find it easy to play many roles- leader, follower, athlete, traveler, church goer, etc.	____	____
37. People seek me out to tell me about their troubles.	____	____
38. I think I have unusual skill for assessing the motivation of other people.	____	____
39. I have unusual skills for making groups, clubs, or organizations function efficiently.	____	____

40. How much of the time at work do you spend with your supervising physicians?

(1) _____ almost none of the time
(2) _____ only a small amount of the time
(3) _____ a good deal of the time
(4) _____ most of the time
(5) _____ almost all of the time

41. How has your responsibility for patient care changed during your career as a physician assistant?

(1) _____ it has become less
(2) _____ it has remained about the same
(3) _____ it has become a little greater
(4) _____ it has become a good deal greater
(5) _____ it has become much greater

42. How many aspects of your job do not require the special training you have received as a physician assistant?

(1) _____ almost no aspects
(2) _____ a few aspects
(3) _____ many aspects
(4) _____ most aspects

43. How many aspects of your job require more training than you have received as a physician assistant?

(1) _____ almost no aspects
(2) _____ a few aspects
(3) _____ many aspects
(4) _____ most aspects

44. Do you feel your present job is not challenging enough for you?

(1) _____ yes

(2) _____ undecided

(3) _____ no

45. Do you feel your present job is too challenging for you?

(1) _____ yes

(2) _____ undecided

(3) _____ no

46. How difficult would it be for you to obtain a satisfactory job in a field different from the work of a physician assistant?

(1) _____ it would be almost impossible

(2) _____ it would be quite difficult, but I could probably locate one eventually

(3) _____ I could find one without too much difficulty

(4) _____ I could locate one with very little effort

(5) _____ I already know of one or more positions available to me

47. Have you considered getting into a field different from the work of a physician assistant?

(1) _____ yes, seriously

(2) _____ yes, but not seriously

(3) _____ no, but I might in the future

(4) _____ I would never consider it

48. For physician assistants in general, the opportunities for career advancement are:

(1) _____ unlimited
(2) _____ quite numerous
(3) _____ fairly numerous
(4) _____ limited
(5) _____ nonexistent

49. In your present job, the opportunities for career advancement are:

(1) _____ unlimited
(2) _____ quite numerous
(3) _____ fairly numerous
(4) _____ limited
(5) _____ nonexistent

50. How much annual income, on the average, do most of the physician assistants you know make?

(1) _____ less than $8,000
(2) _____ between $8,000 and $10,000
(3) _____ between $10,000 and $12,000
(4) _____ between $12,000 and $14,000
(5) _____ between $14,000 and $16,000
(6) _____ between $16,000 and $18,000
(7) _____ between $18,000 and $20,000
(8) _____ greater than $20,000

51. If a score of 9 represents the highest social standing a person could have and a score of 1 represents the lowest social standing a person could have, what is the actual social standing of persons in the 3 occupations listed below? In addition, what is the social standing you feel these persons deserve? (check the appropriate blank)

Physicians									
actual social standing	1	2	3	4	5	6	7	8	9
deserved social standing	1	2	3	4	5	6	7	8	9
R.N. and B.S. Nurses									
actual social standing	1	2	3	4	5	6	7	8	9
deserved social standing	1	2	3	4	5	6	7	8	9
Physician Assistants									
actual social standing	1	2	3	4	5	6	7	8	9
deserved social standing	1	2	3	4	5	6	7	8	9

52. What is your approximate income and the income you feel you deserve?

approximate income $ __________ per year

deserved income $ __________ per year

53. How many patients depend upon you as their primary health care provider?

____

54. What percentage of your patients do you think prefer to see you rather than a physician?

_____%

55. What percentage of your patients do you think would prefer to see a physician rather than yourself?

____%

56. With how many physicians do you work closely? ____

57. How many other physician assistants work with you? ____

58. In your relationships with the physicians with whom you work, how great of a problem are the following?

	Is not a Problem (1)	Is a minor Problem (2)	Is a major Problem (3)
obtaining assistance when I need it	____	____	____
following instructions they give	____	____	____
developing warm working relationships	____	____	____
acceptance of me in my role	____	____	____

59. In your relationships with the staff nurses and other non-physician health professionals with whom you work, how great of a problem are the following?

	Is not a Problem (1)	Is a minor Problem (2)	Is a major Problem (3)
obtaining assistance when I need it	____	____	____
following instructions I give	____	____	____
developing warm working relationships	____	____	____
acceptance of me in my role	____	____	____

60. In the first set of columns below, indicate to what extent a job would have to satisfy each of these requirements before you could consider it to be IDEAL. In the second set of columns indicate whether your present job satisfies each of these requirements.

	In the job which is IDEAL for me, that is:			In my present job, that is:	
	Extremely Important (1)	Important (2)	Unimportant (3)	Present (1)	Absent (2)
(1) Provide an opportunity to use my special abilities or aptitude	____	____	____	____	____
(2) provide me with a chance to earn a good deal of money	____	____	____	____	____
(3) permit me to be creative and original	____	____	____	____	____
(4) give me social status and prestige	____	____	____	____	____
(5) give me an opportunity to work with people rather than things	____	____	____	____	____
(6) enable me to look forward to a stable, secure future	____	____	____	____	____
(7) leave me relatively free of supervision by others	____	____	____	____	____
(8) give me a chance to exercise leadership	____	____	____	____	____
(9) provide me with adventure	____	____	____	____	____
(10) give me an opportunity to be helpful to others	____	____	____	____	____
(11) give me a chance to learn more about my field	____	____	____	____	____
(12) provide me with a good deal of leisure time	____	____	____	____	____
(13) provide me with satisfying interpersonal relationships	____	____	____	____	____

61. How many other physician assistants are there with whom you are friendly and who live in the same city or nearby?

_____

62. How busy are you at work generally?

(1) _____ extremely busy

(2) _____ quite busy

(3) _____ fairly busy

(4) _____ not too busy

63. How important are each of the following in doing your job well?

	Extremely Important (1)	Important (2)	Fairly Important (3)	Not Too Important (4)
understanding one's self	_____	_____	_____	_____
intelligence	_____	_____	_____	_____
trusting one's self	_____	_____	_____	_____
a sense of responsibility	_____	_____	_____	_____

64. Do you belong to any professional associations for physician assistants?

(1) _____ yes

(2) _____ no

If so, do you regularly attend meetings of any of these organizations?

(1) _____ yes

(2) _____ no

65. When you were in high school, what occupation did you plan to pursue? (be as specific as you can)

____

66. What was your class standing in high school?

(1) _____ top 25%

(2) _____ second quarter

(3) _____ third quarter

(4) _____ bottom 25%

67. What is the present occupation of your closest high school friend? (Be as specific as you can.)

____

____

68. How well did you perform in basic science and classroom work during your training to become a physician assistant? Would you say that you were:

(1) _____ one of the top students

(2) _____ above average

(3) _____ below average

(4) _____ at the bottom of the class

69. How well did you perform in patient care activities during your training to become a physician assistant? Would you say that you were:

(1) _____ one of the top students

(2) _____ above average

(3) _____ below average

(4) _____ at the bottom of the class

70. Have you taken the National Certifying Examination for Primary Care Physician Assistants?

(1) _____ yes

(2) _____ no

71. If yes, did you pass?

(1) _____ yes

(2) _____ no

72. What was your father's occupation when you were in high school?

____

73. How far did your father go in school?

(1) _____ did not graduate from high school

(2) _____ graduated from high school

(3) _____ had some education after graduating from high school

(4) _____ graduated from college

(5) _____ obtained a master's degree

(6) _____ obtained a doctoral degree

74. What is your sex?

(1) _____ male

(2) _____ female

75. How old are you? _____

76. How many years of post-high school education did you complete prior to beginning formal physician assistant training?

_____ years

77. What type of educational program was that?

(1) _____ community college

(2) _____ vocational or health professional training program

(3) _____ college

(4) _____ other (describe:___________________________)

78. If you had on-the-job medical experience prior to beginning formal physician assistant training, indicate below:

	number of years
medical corpsman	_____
registered nurse	_____
licensed practical nurse	_____
medical technician	_____
medical aide	_____
physical or occupational therapist	_____
social worker	_____
other (describe:______________)	_____

79. Which physician assistant program did you attend?

____

What year did you graduate? ______

80. How many jobs have you held since graduation from physician assistant training?

______

81. Describe briefly your responsibilities in your present position.

____

____

____.

82. What is the specialty or subspecialty of the physicians with whom you are associated? ____________________.

83. In what type of practice setting do you now work? (Check one or more of appropriate categories.)

(1) ____ private solo practice

(2) ____ private group practice

(3) ____ community based clinic

(4) ____ hospital outpatient clinic

(5) ____ hospital emergency room

(6) ____ hospital inpatient services

(7) ____ other (specify: ____________________)

84. What is the income of most of your patients?

(1) ____ low income

(2) ____ middle income

(3) ____ fairly wealthy

85. In what size community do you work?

(1) ____ over 1 million people

(2) ____ 250,000 to 999,999

(3) ____ 50,000 to 249,999

(4) ____ 10,000 to 49,999

(5) ____ under 10,000

86. If you work in a city of over 250,000 people, is your job located in the central part of the city or in the suburbs?

(1) _____ central city

(2) _____ suburbs

87. What percentage of your time at work is devoted to the following activities?

patient care with supervising physician present _____%

patient care with supervising physician absent _____%

technical or laboratory work _____%

clerical or secretarial work _____%

teaching other health professionals _____%

other (specify: ______________________) _____%

88. What is the average number of hours you work per week?

_____hours

89. How many hours do you usually work in the evenings or during the weekends during an average week?

_____hours

We would like to ask your supervising physician several questions about your work. If you have no objections to this, please print his name and address below.

____

____

____

____

Would you like to receive a summary of the major findings of this study? If so, please print your name and address below.

____

____

____

____

Do you have any additional comments?

____

____

____

____

____

____

____

Please return this questionnaire to:

Dr. Henry B. Perry
Phipps 516
The Johns Hopkins Hospital
601 North Broadway
Baltimore, Maryland 21205

APPENDIX B

QUESTIONNAIRE SENT TO SUPERVISING PHYSICIANS

THE JOHNS HOPKINS UNIVERSITY · BALTIMORE, MARYLAND 21218

DEPARTMENT OF
SOCIAL RELATIONS

July 29, 1975

Dear Doctor:

I am conducting a study of the vocational experiences of physician assistants in cooperation with the Association of Physician Assistant Programs. Your physician assistant recently gave me permission to ask you several questions about his or her work. I would greatly appreciate your completing this enclosed questionnaire. Your responses will remain strictly confidential.

You may have received a similar questionnaire earlier. Unfortunately, as a result of a clerical error made at that time, it has become necessary for me to ask you to complete this enclosed questionnaire even if you did return a previous one

Thanking you in advance, I am

Sincerely yours,

Henry B. Perry, M.D.

Henry B. Perry, M.D.
Department of Social Relations

HBP:pms

THE JOHNS HOPKINS UNIVERSITY · BALTIMORE, MARYLAND 21218

DEPARTMENT OF
SOCIAL RELATIONS

August 30, 1975

Dear Physician:

Several weeks ago we sent you a brief questionnaire as part of a study I am conducting of the vocational adjustment of physician assistants. Several months ago your physician assistant gave me permission to ask you some questions about his work. To date we have not heard from you.

I know that you are quite busy and find such details as this unpleasant, but completion of this questionnaire requires only one to two minutes of unpleasantness. Anyone can spare that much! We would greatly appreciate your completing the enclosed questionnaire as soon as possible.

Sincerely yours,

Henry B. Perry

Henry B. Perry, M.D.

HBP:pms

SURVEY OF PHYSICIANS WORKING WITH PHYSICIAN ASSISTANTS

Please answer each question by checking the response category which you feel answers the question best. Each question refers to

1. How satisfied have you been in general with the work of this person?

(1) _____ greatly satisfied

(2) _____ moderately satisfied

(3) _____ mildly satisfied

(4) _____ mildly dissatisfied

(5) _____ moderately dissatisfied

(6) _____ greatly dissatisfied

2. If you had it to do over again, would you hire this particular person?

(1) _____ definitely no

(2) _____ probably no

(3) _____ probably yes

(4) _____ definitely yes

3. How many aspects of his/her job do not require the special training received in becoming a physician assistant?

(1) _____ almost no aspects

(2) _____ a few aspects

(3) _____ many aspects

(4) _____ most aspects

4. How many aspects of his/her job require more training than that received in becoming a physician assistant?

    (1) _____ almost no aspects

    (2) _____ a few aspects

    (3) _____ many aspects

    (4) _____ most aspects

5. Do you feel this person's job is too challenging for him/her?

    (1) _____ yes

    (2) _____ no

6. Do you feel this person's job is not challenging enough for him/her?

    (1) _____ yes

    (2) _____ no

7. How much confidence do you have in the work this person does?

    (1) _____ complete confidence

    (2) _____ almost complete confidence

    (3) _____ a lot of confidence

    (4) _____ quite a bit of confidence

    (5) _____ a fair amount of confidence

8. How well does this person relate to patients?

    (1) _____ as well as any of the people I work with

    (2) _____ quite a bit better than most of the people I work with

    (3) _____ better than most of the people I work with

    (4) _____ about as well as most of the people I work with

    (5) _____ not quite as well as most of the people I work with

9. How knowledgeable is this person about the various clinical problems which he/she sees at work?

(1) _____ extremely knowledgeable

(2) _____ quite knowledgeable

(3) _____ fairly knowledgeable

(4) _____ somewhat knowledgeable

(5) _____ not too knowledgeable

10. How often do you feel this person has done an exceedingly good job at work?

(1) _____ almost always

(2) _____ most of the time

(3) _____ frequently

(4) _____ sometimes

(5) _____ almost never

11. What is this person's approximate income and the income you feel he/she deserves?

approximate income $__________ per year

deserved income $__________ per year

Please return this questionnaire to:

Dr. Henry B. Perry, M. D.
Phipps 516
The Johns Hopkins Hospital
601 North Broadway
Baltimore, Maryland 21205

APPENDIX C

COMPARISON OF SELECTED CHARACTERISTICS OF MEDEX AND DUKE RESPONDENTS WITH THEIR RESPECTIVE POPULATIONS

The National Council of MEDEX Programs (1974) has reported selected characteristics for the population of Medex who had graduated before January, 1974. Of these 277 graduates, 250 were found to be involved in patient care. A comparison of their characteristics with our Medex respondents is shown in Table 1.

These comparisons demonstrate rather close agreement between the characteristics of MEDEX respondents and the total population of MEDEX graduates. Those differences which do exist however, may be, to a large extent, artifactual. For example, some of the differences in the specialty distributions of these two groups shown in Table C-1B appear to be due to differences in classification procedures. The MEDEX Council's report includes only general surgery in the "surgery" category and classifies those employed in surgical subspecialties as being in the "subspecialty" category. Similar differences in classification may apply to the "family practice" and "specialty primary care" categories as well.

In addition, the MEDEX Council's report includes only those who had graduated before January, 1974, while our study sample includes graduates as of the fall of 1974. Thus, it is conceivable that to

Table C-1

Comparison Of MEDEX Respondents With The Total Population Of MEDEX Graduates As Of January, 1974

	MEDEX respondents	MEDEX population[a]
A. Sex	(N=174)	(N=277)
men	93.1%	96.0%
women	6.9	4.0
	100.0	100.0

B. Specialty	(N=168)	(N=248)
family practice	64.9%	76.1%
specialty primary care	19.0	11.7
surgery	11.9	3.3
subspecialties	4.2	8.9
	100.0	100.0

---

[a] Source: National Council of MEDEX Programs (1974).

Table C-1 (continued)

	MEDEX respondents	MEDEX population
C. Practice Setting	(N=162)	(N=246)
private practice	68.5%	85.3%
institutional practice	31.5	14.7
	100.0	100.0
D. Community Size	(N=168)	(N=250)
less than 10,000	43.5%	55.6%
10,000 to 49,999	29.8	26.8
greater than 50,000	26.7	17.6
	100.0	100.0

some extent the observed differences between our MEDEX respondents and the population of MEDEX graduates are due to actual changes in the characteristics of graduates since January, 1974.

Support for this hypothesis is provided by MEDEX Council data for those trainees who had not graduated by January, 1974. Differences between MEDEX respondents and the MEDEX population in their practice settings and community locations are similar to differences reported by the MEDEX Council between trainees and graduates as of January, 1974.[1] A number of these trainees had graduated by the time the data for our project were collected and these persons presumably are included among our respondents.

The percentage of trainees working in institutional settings is about twice that reported by the MEDEX Council for their graduates. A similar difference exists between MEDEX respondents and the population of MEDEX graduates (see Table C-1C). MEDEX trainees are also almost twice as likely to be working in communities of 50,000 or more persons as are those who had graduated by January, 1974. In Table C-1D it can be seen that MEDEX respondents are more likely than the MEDEX population to be located in larger communities. Thus the differences observed in the practice settings and community locations of these two MEDEX groups may result from the inclusion of more recent graduates in our sample.

---

[1] Trainees work for one year with a preceptor who is a practicing physician and are generally employed by that preceptor following graduation. Thus these data likely reflect the practice settings and community location of future graduates.

In summary, then, the observed differences between those MEDEX participating in the present study and the population of MEDEX graduates as of January, 1974, appear to be small. Those differences which are present appear to reflect alternative classification procedures (in the case of specialty) or changes in the characteristics of MEDEX graduates since January, 1974. Thus we conclude that the MEDEX respondents are reasonably representative of the population of MEDEX graduates at the time our data were collected.

In order to assess further the adequacy of the study sample, Duke graduates participating in the present study have been compared with the entire population of Duke students at the time these respondents were in training. David Lewis (1975) provides selected information for students who entered the Duke program from 1971 to 1975.

Since our study includes graduates as of the fall of 1974, only students who entered in 1971 or 1972 would have graduated by the time the present data were collected.

Table C-2 compares the characteristics of Duke respondents who graduated in 1973 or 1974 with those of students who entered the Duke program in 1971 or 1972. Inspection of this table reveals only minor differences between these two groups. Therefore the Duke respondents appear to be representative of the population of Duke students with whom they trained.

In short, these comparisons reveal close similarity between the MEDEX and Duke respondents and their respective populations. This finding increases the confidence with which our results may be generalized to the entire population of physician assistants as of the fall of 1974.

Table C-2

Comparison Of Respondents Who Graduated From Duke in 1973 Or 1974 With The Population Of Students Who Entered The Duke Program In 1971 Or 1972

	Duke respondents (N=61)	Duke population[a] (N=68)
A. Mean Age	30.2	31.0[b]
B. Sex Distribution		
men	88.5%	86.8%
women	11.5	13.2
	100.0	100.0
C. Number of Years of Prior Medical Experience	4.2	5.0

---

[a] Source: David Lewis (1975).

[b] Lewis reported the mean age at the time students entered the Duke program. These figures have been adjusted to refer to the age of the Duke population at the time the data for this project were collected.

APPENDIX D

SUPPLEMENTARY TABLES FOR CHAPTER 3

Table D-1

Specialty By Community Size For Civilian Physician Assistants

	under 10,000 (n=215)	10,000 to 49,999 (n=201)	50,000 to 249,999 (n=157)	250,000 to 999,999 (n=110)	1 million and over (n=94)
General primary care (n=320)	67.0%	38.3	37.6	27.3	10.6
Specialty primary care (n=220)	17.7	31.8	26.8	29.1	46.8
Surgery (n=165)	12.0	21.4	24.2	28.1	28.8
Other specialties(n=72)	3.3	8.5	11.4	15.5	13.8
	100.0	100.0	100.0	100.0	100.0

Table D-2

Correlations Between Job Characteristics

	lev resp	# hrs week	M D role sup	nurse accep	patient accep	income	prestige	job opp	car opp
lev resp	1.000								
# hrs wk	n.s.	1.000							
MD role sup	.356 (939)	n.s.	1.000						
nurse accep	.145 (939)	n.s.	.206 (939)	1.000					
patient accep	.293 (705)	n.s.	.145 (705)	n.s.	1.000				
Income	.181 (911)	.263 (898)	.118 (911)	.122 (911)	n.s.	1.000			
Prestige	.150 (868)	n.s.	.162 (868)	.225 (868)	.176 (661)	.162 (847)	1.000		
Job opp	.190 (913)	n.s.	.180 (913)	.157 (913)	n.s.	.187 (885)	.144 (844)	1.000	
Car opp	.138 (928)	n.s.	.350 (928)	.147 (928)	.133 (701)	.115 (903)	.199 (860)	.180 (903)	1.000

Table D-3

Type Of Physician Assistant Program By Number Of Years Of Post-High School Education Before Beginning Physician Assistant Training

	number years of education	S.D.
associate (n=284)	3.11	1.86
assistant (n=368)	2.65	1.78
MEDEX (n=173)	2.04	1.57
military (n=99)	1.66	1.31

APPENDIX E

SUPPLEMENTARY TABLES FOR CHAPTER 5

Table B-1

Zero-Order and Partial Correlations Between Variables
At the Same Stage of Causation in the Model
Shown in Figure 3, Chapter 5[a]

Work Environment Characteristics

	SPCLTY 1	SPCLTY 2	PRACTICE	SIZE COMM
SPCLTY 1	____	-.718	.335	-.133
SPCLTY 2	-.574	____	.078	.046
PRACTICE	-.188	.154	____	.057
SIZE COMM	-.031	.112	.164	____

Job Characteristics

	LEV RESP	MD ROLE SUP	RN ACCEP	INCOME	PRESTIGE	JOB OPP	CAR OPP
LEV RESP	____	.351	.062	-.024	.048	.032	.007
MD ROLE SUP	.420	____	.164	.014	.118	.126	.349
RN ACCEP	.171	.191	____	.016	.160	.071	.113
INCOME	.222	.115	.116	____	.033	.005	.001
PRESTIGE	.196	.177	.215	.164	____	.031	.105
JOB OPP	.209	.193	.142	.166	.131	____	.053
CAR OPP	.155	.392	.173	.142	.186	.153	____

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[a] Partial correlations are above the diagonal

Table E-2

Significant (p<.001) Standardized Path Coefficients for the Causal Models Shown in Figures 3.5.6, and 8 of Chapter 5 Using the Self-Rating Measure of Job Performance and Only Those Cases Included in the Path Analysis of Physician Performance Ratings (N=506)

	SPCLTY 1	SPCLTY 2	PRACTICE	SIZE COMM	LEV RESP	MD ROLE SUP	RN ACCEP	INCOME	PRESTIGE	JOB OPP	CAR OPP	JOB PERF	JOB SAT
AGE	.083							.099				.147	.110
SEX	.080	-.164	-.075	-.146			.090	.149		.168		.181	
INTER COMP				.149	.227	.110		.150	.096	.188	.249	.386	
NO YRS ED		-.109								.084			-.076
NO YRS EXP			-.097				-.114						
PRGM 1		.089			.166		.115	.129	.096	.209			
PRGM 2	.207		-.080	-.173	.082			-.116			-.095		.077
PRGM 3	.119		.381		.156			-.171	-.124	.163	-.180		
ACAD PERF			-.083				.083	.081				.066	
PT PERF					.092				.091			.121	
YR GRAD					-.113		-.111	-.210	-.080	-.101	.103		.083
SPCLTY 1					.134			.104					
SPCLTY 2													
PRACTICE					.176							-.202	-.123
SIZE COMM						-.105		-.083	-.103	-.078	-.104	.111	
LEV RESP												.348	.126
MD ROLE SUP												.149	.391
RN ACCEP												.073	.067
INCOME													[illegible]
PRESTIGE													
JOB OPP												.075	.113
CAR OPP												.073	.164
R^2	.093	.059	.156	.095	.199	.034	.070	.224	.088	.149	.117	.629	.451

TABLE E-3

Significant (p<.001) Standardized Path Coefficients for the Causal Models Shown in Figures 4 and 7 of Chapter 5 Using the Self-Rating Measure of Job Performance and Only Those Cases Included in the Path Analysis of Physician Performance Ratings
(N=506)

	SPCLTY 1	SPCLTY 2	PRACTICE	SIZE COMM	JOB PERF	LEV RESP	MD ROLE SUP	RN ACCEP	INCOME	PRESTIGE	JOB OPP	CAR OPP	JOB SAT
AGE	.082				.167				.082			-.104	
SEX	.080	-.164	-.075	-.146	.203	-.125			.128		.126		-.107
INTER COMP				.149	.507	-.077	-.128	-.216	.098		.082	.095	-.214
NO YRS ED		-.109			-.064				.073		.096		
NO YRS.EXP			-.097					-.104					.094
PROM 1		.089				.133		.097	.124	.087	.199		
PROM 2	.207		-.080	-.173		.078			-.117		.078	-.097	.066
PROM 3	.119		.391		.105	.093	-.107		-.181	-.142	.141	-.212	
ACAD PERF			-.083		.099								
PT PERF					.154		-.075						
YR GRAD								-.102	-.208	-.076	.096	.113	.076
SPCLTY 1						.104			.099				
SPCLTY 2													
PRACTICE					-.130	.256	.110						
SIZE COMM					.070	-.079	-.137		-.090	-.114	-.093	-.126	-.082
JOB PERF						.602	.470	.346	.102	.169	.210	.303	.491
LEV RESP													
MD ROLE SUP													.321
RN ACCEP													
INCOME													.077
PRESTIGE													.059
JOB OPP													.078
CAR OPP													.128
R^2	.093	.059	.156	.095	.439	.402	.157	.137	.230	.104	.174	.168	.542

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Ph.D. Degree

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Residency

Publications

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